

Advanced Studies in E-Commerce

Qinghong Shuai · Zhongjun Li ·
Yun Zhang

E-Commerce Industry Chain

Theory and Practice



西安交通大学出版社
XI'AN JIAOTONG UNIVERSITY PRESS



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Advanced Studies in E-Commerce

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Qinghong Shuai, School of Economic Information Engineering, Southwestern University of Finance and Economics, Chengdu, China

Ronggang Zhang, School of Management, Northwest University of Politics and Law, Xi'an, China

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Li Xiong, Department of Information Management, Shanghai University, Shanghai, China

Jie Cao, Professor in the College of Information Engineering, Nanjing University of Finance and Economics, Nanjing, China

Advanced Studies in E-Commerce takes a fresh and global viewpoint to E-Commerce development. It encompasses such issues as the basic concepts and principles of E-Commerce, the industry chain of E-Commerce, the security management of E-Commerce; the architecture of E-Commerce; the analytics of E-Commerce; and some cutting-edge topics of E-Commerce.

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Qinghong Shuai
School of Management Science
and Engineering
Southwestern University of Finance
and Economics
Chengdu, Sichuan, China

Zhongjun Li
School of Management Science
and Engineering
Southwestern University of Finance
and Economics
Chengdu, Sichuan, China

Yun Zhang
School of Economic Information
Engineering
Southwestern University of Finance
and Economics
Chengdu, Sichuan, China

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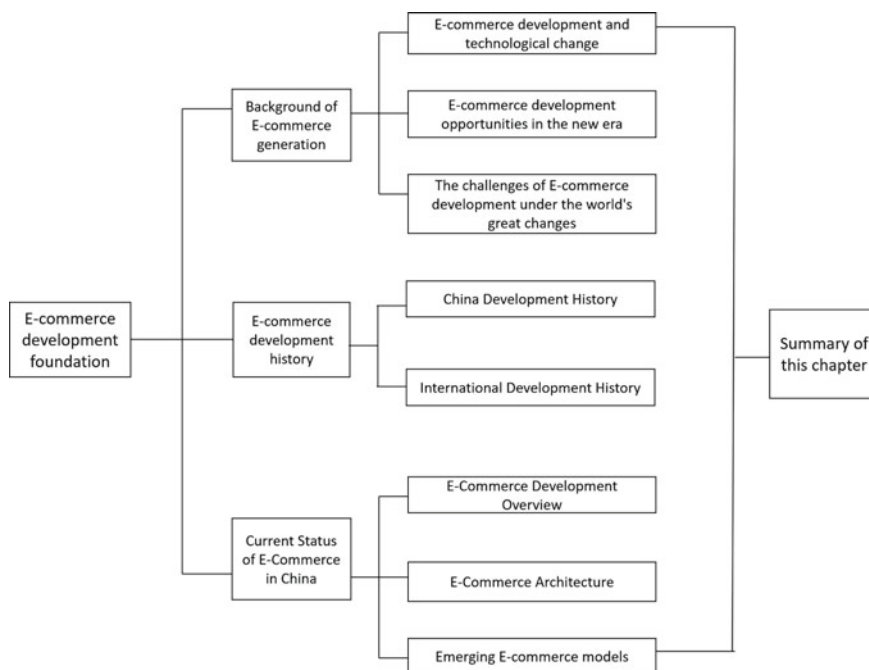
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Chapter 1

Basics of E-Commerce Development



Knowledge Map of this Chapter



Introduction to the Case

E-Commerce and World Development

The development of EDI technology in the 1960s attracted worldwide attention, and this way of electronic communication gave birth to the initial EDI e-commerce, forming the origin of e-commerce in the world. Subsequently, the emergence of the Internet provided a simpler and easier way for the realization of e-commerce. Under the impetus of its rapid development, a new business trade model based on the Internet, with buyers and sellers as the main body, various electronic tools as the means, and network information technology as the backbone, e-commerce emerged and developed.

On September 20, 1987, Qian Tianbai (1945–1998), the “father of the Chinese Internet”, sent the first e-mail from China, and China has been officially connected to the Internet since then. After a decade of Internet exploration, China’s Internet grew slowly to the curtain of China’s e-commerce journey, and 1999 was regarded as the first year of China’s e-commerce. With the increase of China’s Internet penetration rate and the development and maturity of technologies such as big data and artificial intelligence, e-commerce has shown unparalleled vitality and vigor, and has achieved one takeoff after another in the following two decades.

In the process of adapting to the different social needs of each region, the new round of technological revolution and industrial change intersection of e-commerce has shown different development forms; e-commerce in Europe and the United States started early and was widely used; e-commerce in Asia is large and fast developing; e-commerce in Latin America, the Middle East, and North Africa is small and has great potential. Different forms of e-commerce in different regions have formed a diverse global pattern of e-commerce.

The development of e-commerce in each region has made significant contributions to the global economy and has always been in a state of accumulation, and countries attach importance to and continue to introduce relevant policies to stimulate the further development of e-commerce. In the process of e-commerce development, the complex social environment and global situation have given rise to different needs and new models of e-commerce with different characteristics, which further promote the development of the global economy.

E-commerce has become the core of the socio-economic development of countries in this century. This chapter takes the background of e-commerce generation as the starting point, uses a lot of data and diagrams to elaborate on the development history of e-commerce, and discusses the opportunities and challenges of e-commerce in the new situation and environment.

Reflections:

1. Briefly describe the opportunities for e-commerce development in the new era
2. What important role has e-commerce played in promoting economic and social development?

1.1 Background of E-Commerce Generation Cloud

1.1.1 E-Commerce Development and Technological Change

General Secretary Xi Jinping pointed out that since the sixteenth century, human society has entered a period of unprecedented innovation activity, and in a few centuries, human beings have achieved more innovations in science and technology than the sum of the past few thousand years; looking back at the history of world development since modern times, it is clear to see that the innovation capacity of a country and nation fundamentally affects and even determines the future destiny of the country and the nation; if China wants to be strong and rejuvenated, it must vigorously develop science and technology and strive to become the world's major scientific center and innovation highland. Looking back at the development of human beings from agricultural society, industrial society to information society, the way of production, lifestyle, and management of human society have undergone great changes (Fig. 1.1). It can be seen that the scientific revolution is the precursor and source of the technological and industrial revolution; each scientific revolution will lead to numerous disruptive technological innovation, resulting in a large number of major scientific and technological achievements in history, breeding new industries that disrupt the industrial structure, profoundly changing the face and pattern of world development. For the countries that seized the historical opportunity of the scientific and technological revolution, their economic and social development went into a fast lane, and their economic strength and scientific and technological power increased rapidly, and they even became world powers in one leap.

From the age of the steam engine to the age of electrical appliances, and then to the age of information technology, human civilization is now brought into a new era of intelligence. In the wave of economic globalization, the continuous innovation of science and technology calls for the birth of a new order and a new way, and the development and emergence of e-commerce is one of the important expressions of the new way. On the one hand, the wide area of the Internet can break the two-dimensional constraints in time and space, and e-commerce based on the Internet naturally has the natural advantages of being ready and global. On the other hand, e-commerce can integrate the technological achievements brought by the industrial

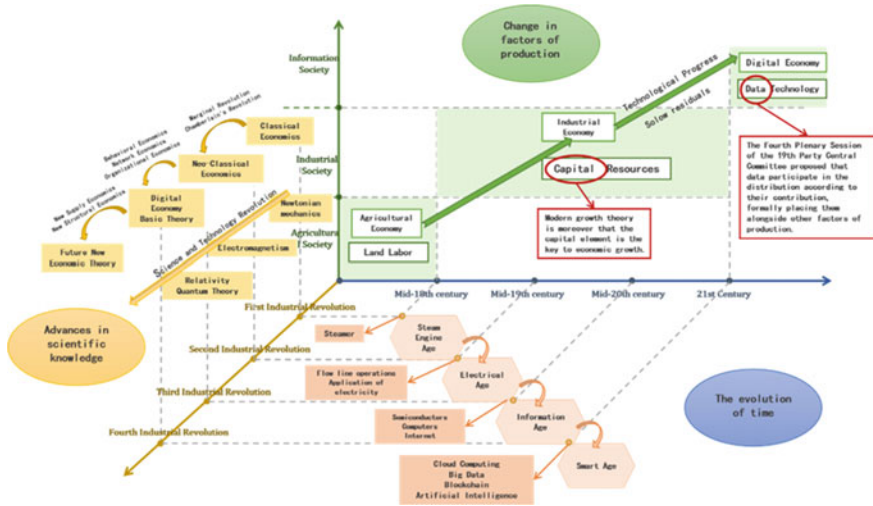


Fig. 1.1 Map of the change in science and technology development

revolution, making it more up-to-date and realizing the convergence and integration of technology and life.

1.1.1.1 Agricultural Economy

The agricultural economy has a long history of development and can be divided into three main important stages: the primitive agricultural economy, the traditional agricultural economy, and the agricultural economy of the “Internet+” era. This is shown in Fig. 1.2.

(1) Primitive agricultural economy

This more traditional agricultural economy emerged mainly in the primitive era, when the productivity of society was very low and the ability of human beings to survive was very weak, in addition to the treacherous changes of nature, which had a great impact on their production and life. The characteristics of agricultural production in primitive societies: first, people in primitive societies used very simple stone tools, wooden stick-type tools, etc.; second, the emergence of rice and pottery as a sign of the emergence of primitive agriculture, and the most prominent technological



Fig. 1.2 History of agricultural economic development

achievement was the domestication of wild animals and animals for their own use; third, the farming methods in primitive societies were crude, and the most primitive slash-and-burn method was used; fourth, agricultural production was based on purely collective labor to maintain a low standard of living. Ecological and environmental problems are the greatest challenges to the development of the original agricultural economy.

(2) Traditional agricultural economy

The traditional agricultural economy is a relatively stable and static economy that relies on human, animal, iron, and hand tools as the main forms of labor, agricultural techniques passed down from generation to generation, self-sufficiency, and feudal tenancy and smallholder production as the mode of operation. The traditional agricultural economy emerged from the slave and feudal societies. The traditional characteristics of the Chinese agricultural economy are mainly manifested in two aspects. First, the movement of land was frequent, and the mode of land management was fixed for a long period of time. Land mobility refers to the transfer of land contract management rights. The traditional Chinese system of rural land ownership emerged earlier in China, but its application in land management is not mature. Farmers change their land ownership due to their own interest needs, and the peasant family-led business model is very detrimental to the development and improvement of China's agricultural economy. The second aspect is that the linkage between business and commercial exchanges, and agriculture is mutually supportive. The increase in agricultural labor productivity allowed some people to leave agriculture and shift to non-agricultural industries, which promoted the development of commerce and industry while providing favorable conditions for the development of agriculture and agricultural technology. China's large population, small arable land area, and imperfect agro-industrial structure have resulted in a rational distribution of agricultural resources in China. The development of agro-industrial combinations is both risky and involves higher investment and technological innovation.

(3) Modern agricultural economy

Under the background of "Internet+", China's agricultural economy has been developed continuously, so it must be built and developed comprehensively. First of all, according to China's current development situation, it is necessary to formulate perfect supporting policies to improve farmers' income. At the same time, we should increase investment in agricultural e-commerce, and according to China's current development status of agricultural e-commerce, we should learn from some foreign experiences to promote China's agricultural e-commerce model to be more adaptable to China's agricultural economic development and lay a good foundation for the professional operation of China's agricultural products. And we also hope that major enterprises will actively participate in building e-commerce platforms and strengthen cooperation with logistics companies to ensure the rapid circulation of Chinese agricultural products and expand their business fields as well as business scope. And to do a good job in the e-commerce of agricultural products, it is necessary to apply information technology to the logistics and transportation management of agricultural

products. Fourth, we should pay attention to the construction and development of regional e-commerce platforms, and build sound links between large supermarkets and enterprises based on different business models to promote the overall circulation of agricultural products and lay a solid foundation for promoting the rapid development of the rural economy.

1.1.1.2 Industrial Economy

Modern society has gone through three industrial revolutions: mechanization, electrification, and informatization. Today, the world is in the fourth industrial revolution, which is characterized by intelligence. If the first industrial revolution (Industry 1.0) has changed the production method from manual production to mechanical production, the second industrial revolution (Industry 2.0) has made mass production possible, and the third industrial revolution (Industry 3.0) has automated production, then in the era of Industry 4.0, the fourth industrial revolution, the “physical system” created by the first and second industrial revolutions will be combined with the “information system” created by the third industrial revolution. This will make production intelligent and customized, and will also make more energy-efficient, green, and intelligent factories a reality (Fig. 1.3).

(1) Industrial revolution 1.0

Steam technology brought mechanization. This was marked by the emergence of the steam engine, which ushered in a wave of industrialization that replaced manual labor with machines. The machines used in the first Industrial Revolution were driven by steam or water power, replacing manual labor with machines for the first time, which was of epochal importance and brought human society into the “Age of Steam”.

(2) Industrial revolution 2.0

Electrical technology brought electrification. The symbol is the use of the internal combustion engine and electricity, new energy, and machinery drives the second industrial revolution. Household appliances were widely used; in this era, machinery was already equipped with sufficient power, the development of automobiles, airplanes, ships, and other means of transportation was rapidly changing, and the use of various types of machines was expanding. In addition, the dissemination of information has become the cornerstone of the third industrial revolution because of



Fig. 1.3 Industrial economy development history

the advancement of cell phone technology, which has made communication more convenient.

(3) Industrial revolution 3.0

Information technology brings automation. Represented by computers, aerospace, and atomic energy, we entered the information age. The third industrial revolution has undergone more dramatic changes compared with the second industrial revolution. On the one hand, it has made traditional industries more mechanized and automated, reduced industrial costs, changed the mode of operation of the entire social production, and gradually shifted to large-scale production; The marked text is unclear. Please re-mark. Ensure marking is within one paragraph and includes any spaces around words. The development and application of the Internet in information technology have enabled everyone in the world to be connected.

(4) Industrial revolution 4.0

The integration of innovative technologies brings intelligence. With artificial intelligence, driverlessness, clean energy, etc. we are entering the age of intelligence. The timing of the fourth industrial revolution is rather ambiguous. To date, the achievements of the fourth industrial revolution have not yet covered the scale of the third industrial revolution, and we should now be in the transition period from the third industrial revolution to the fourth industrial revolution. In the future, Internet of Things technology and big data will assume the core technology support in the fourth industrial revolution, and more and more robots will replace manual labor to promote the transformation of human society from “informationization” to “intelligence”. So far, the achievements of the fourth industrial revolution have not yet covered the scale of the third industrial revolution, and it has not yet reached the extent of the transition period between the third industrial revolution and the fourth industrial revolution. With the development of the Internet of Things, big data, and other technologies, it will become the key technical support for the fourth industrial revolution, which will shift from “information” to “intelligence”.

1.1.1.3 Digital Economy

The digital economy is a new economic form with digital technology as the main driving force, digital technology as the main carrier, digital technology as the main carrier, digital technology and the deep integration of the real economy, and digital, networked, intelligent level, to accelerate the reconstruction of economic development and governance models as shown in Fig. 1.4.

Throughout the development history of the global digital economy, the digital economy has been emerging since the 1940s and has been developing for more than 70 years now. Figure 1.5 shows the development timeline of the global digital

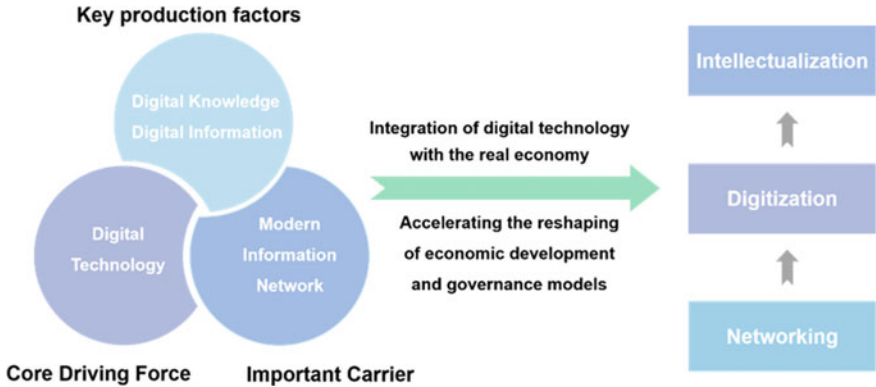


Fig. 1.4 Digital economy concept map

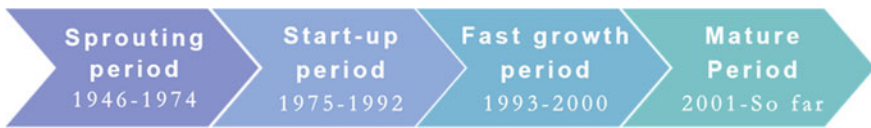


Fig. 1.5 Global digital economy development timeline

economy. According to the development process of digital economy technology and related industries, the development of the digital economy can be divided into four periods: the budding period, the nurturing period, the rapid growth period, and the mature period.

(1) Sprouting period (1946–1974)

During the Sprouting period, the birth of the digital economy was marked by the invention of the computer and the emergence of hardware, software, and application technologies. In 1946, the world’s first computer, the ENIAC, was born. By 1947, the application of transistors set off the microelectronics revolution. In 1954, IBM invented TRADIC, the first computer with transistors, which dramatically increased the computing power of computers compared to the previous ones. In 1968, Intel (Intel) was founded in Silicon Valley to develop CPU processors, which later led to the global computer and Internet revolution. In 1971, Intel developed DRAM memory, and the era of integrated circuits was officially opened. In the same year, Intel launched the world’s first microprocessor, the 4004, and the era of small computers was officially opened.

(2) Start-up period (1975–1992)

During the incubation period, the development of the digital economy in the nascent stage was mainly manifested by the increasing maturity of computer technology and the expansion of application fields. During this period, the IT industry gradually

took shape and the software and hardware developed rapidly. At the same time, the application of digital technology was extended from scientific research and the military to business and life. During that period, many well-known companies emerged, whether in hardware, software, or applications, and together they contributed to the development of digital technology. In the software field, Bill Gates and Paul Allen founded Microsoft Group in 1975 and released Microsoft Windows 1.0, the first product of the Windows operating system series, in 1985. In the hardware field, IBM developed the world's first personal computer, IBM 5150, in 1981, marking the dawn of the personal computer era. In the application field, in 1977 Ellison and Robert founded Oracle Corporation, which developed a commercial SQL database. During the start-up gestation period, the progress of the digital economy was mainly reflected in the maturation of computer technology and the expansion of the scope of applications. During this period, the IT industry began to take shape, with rapid growth in both the software and hardware sectors. At the same time, the scope of digital technology applications expanded from research and the military to business and everyday life.

(3) Fast growth period (1993–2000)

During the fast growth period, the digital economy industry developed rapidly. With the maturity of network technology and personal computer software and hardware technology, the network economy developed rapidly, and industries such as e-commerce in the digital economy were born. In September 1993, the U.S. government announced the National Information Infrastructure Action Plan, which aimed to promote the development of information infrastructure and digital technology in the U.S. and marked the formal entry of the global digital economy. The implementation of the “Information Superhighway” strategy established the U.S. as the “leader” in the global digital economy. During this period, many famous Internet companies were born, and they were the trend of digital economy development, and pushed it into the era of rapid development.

In 1994, Netscape Communications was officially established, and in December of the same year, Netscape Browser version 1.0 “Netscape Navigator” was released, becoming the most popular web browser at that time. Jeff Bezos founded Amazon.com in 1995 as one of the first companies to launch online electronic services, kicking off the era of global e-commerce. Larry Page and Sergey Brin officially founded Google in 1998 to open the exploration of the search service field. China's three current Internet giants, Tencent, Alibaba, and Baidu, were founded in 1998, 1999, and 2000 respectively, kicking off the Internet era in China.

(4) Maturity period (2001–present)

Since the twenty-first century, countries have paid more and more attention to the development of the digital economy. At the same time, the changes in digital technology have made the digital economy move into the mobile network era and opened a new round of Internet boom. Since the beginning of the twenty-first century, countries

have gradually increased their support for the development of the digital economy and have enacted relevant policies to promote the development of the digital economy in their countries. Many developed countries began to lay out the digital economy at the beginning of the twenty-first century, and the United States began to lay out in the early 1990s. Japan first introduced the e-Japan strategy in 2001; the goal is to vigorously carry out the construction of digital infrastructure to promote the development of the digital economy industry. Subsequently, Japan has released u-Japan and i-Japan strategy documents. In 2009, the UK released the “Digital Britain” plan, which aims to increase the penetration of the digital economy among the public, promote the application of digital technology, and provide better digital protection for various market players. In contrast, most developing countries have only started to lay out the development of a digital economy in recent years. India, for example, launched “Digital India” in 2015, investing a lot of money to popularize broadband Internet access, establish national data centers, and promote e-governance development.

1.1.2 E-Commerce Development Opportunities in the New Era

1.1.2.1 E-Commerce to Help Build a New Development Pattern of Double Cycle

On May 14, 2020, General Secretary Xi Jinping proposed to build a new development pattern of dual domestic and international cycles that promote each other. The new development pattern of dual cycle is proposed according to China’s current development environment and is a strategic choice that fits China’s new development stage. This is an accurate diagnosis of the complex domestic and international situation, and provides a clear strategic direction for China’s high-quality economic development. The “double cycle” strategy is also included in the 14th Five-Year Plan of the National Economic and Social Development of the People’s Republic of China and the Outline of the Vision 2035. Building a new development pattern of double cycle is a major strategic choice and strategic deployment made by the Party Central Committee to adapt to the new development stage. After the new development pattern of the double cycle was proposed, it received wide attention from the academic community. The academic community generally agrees that the double cycle is a strategic choice for China to cope with the new development situation at home and abroad, which is of great practical significance; the key to the new development pattern of the double cycle lies in building the endogenous power of the double cycle and cultivating new advantages in international cooperation and competition. To promote the new development pattern of double cycle, we need to start from demand-side reform and pay attention to the pull of consumption, industrial support, and the construction of modern circulation system. With the rapid development of the digital economy, the digital economy has become an important grip

to open up the double cycle, which can effectively help the construction of the new development pattern of the double cycle. E-commerce as a new industry, new mode, belongs to the digital economy. Along with the rapid development of information technology, Internet technology and digital technology applications, and social and economic activities, traditional industries and foreign trade deep integration increasingly become an important source of power to promote the new development pattern of the double cycle. Following the trend of e-commerce development and seizing the opportunity of e-commerce development can not only promote China to catch up, break through the low-end lock, and bridge the digital divide in the dominant state of the digital economy era, but also help China to take e-commerce development as a grip to realize the new development pattern of a double cycle by building a domestic demand system and unblocking the domestic and international integration channel.

1.1.2.2 E-Commerce Boosts High-Quality Economic and Social Development

E-commerce is a new type of rapid development in recent years to benefit people's livelihood and stabilize consumption, and is becoming more and more prominent in the pattern of high-quality development and high-level opening to the outside world. Digital business to promote "rural revitalization" strategy, "silk road e-commerce" in the "Belt and Road" construction of the status of increasingly prominent, green e-commerce to promote the "double carbon" development, and "digital business" has become an important part of the digital economy; e-commerce will be closely around the construction of new development pattern and better service a high level of openness, to help high-quality development.

E-commerce will play a pioneering role in implementing the development concept of innovation, coordination, green, open, and shared, and promote high-quality economic and social development. First, grasp the opportunity of consumer upgrading, technological innovation, and model iteration, to achieve a greater scope, broader areas, and deeper integration of innovation. Continuously promote quality consumption, customized consumption, brand consumption, fashion consumption, and individual consumption, and promote the upgrading of the consumer industry chain to meet people's aspirations for a better life. Second, we should actively build an open and shared environment for the growth of e-commerce, and study the data elements in a reasonable manner according to the law. Application, promote sustainable industrial growth, promote open sharing of e-commerce service resources across enterprises, industries, and regions, strengthen industrial collaboration, and promote the development of regional collaboration. Third, advocate green e-commerce. Promote a green, low-carbon development model, enhance the level of green packaging applications in circulation, promote green and low-carbon online shopping consumption methods, and build an e-commerce industry chain conducive to the harmonious coexistence of people and nature.

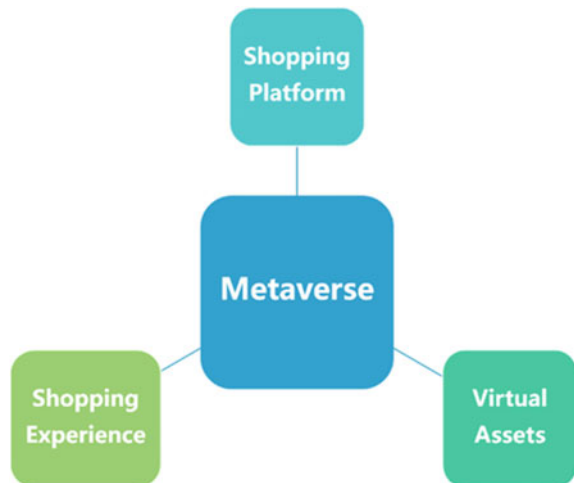
1.1.2.3 E-Commerce Lends a New Track to the Meta-Universe

The Metaverse is a collection of virtual time spaces made up of a series of Augmented Reality (AR), Virtual Reality (VR), and the Internet (Internet). Roblox proposes eight elements of the Metaverse: “identity, friends, immersion, low latency, diversity, anytime, anywhere, economic systems, and civilization.” Wikipedia defines “metaverse” as a 3D virtual space based on the future Internet that is connected, perceptive, and shared through a virtual augmented physical reality that is convergent and physically persistent.

Experts in the field of science and technology summarize three characteristics of the metaverse: first, the metaverse must exist forever, just like the real world; as long as civilization never goes out, the metaverse will always be there; the users of the metaverse can be changed, the game can be changed, and the rules can be adjusted, but the world of the metaverse will always exist. Second, the metaverse must be decentralized. It is not feasible for the metaverse to be open-source and shared if the right of ownership and discourse can only be attributed to a certain company or country. Third, the metaverse must be connected to reality, and the economic system in the metaverse must be directly linked to the economic system in the real world, that is, the influence generated by the identity in the metaverse must be real and not unreal.

In essence, the metaverse is a revolution in the interface between the real world and the virtual world. The immersive experience will eventually win over the abstract program interface, and the real world will be seamlessly linked to the digital world through the immersive experience. It seems that the metaverse will involve all industries in future development, so what kind of connection will there be between the metaverse and the e-commerce industry? Three simple predictions are as shown in Fig. 1.6.

Fig. 1.6 Metaverse and e-commerce



Meta-universe+shopping platform: Each e-commerce platform can enter the meta-universe, form a unique virtual e-commerce platform within it, occupy a place in the blue ocean space of the meta-universe, establish their own virtual shopping mall in the virtual world, and provide services to users throughout the meta-universe, opening up a new world for them.

Meta-universe+shopping experience: Consumers can consume through various virtual stores and e-commerce platforms in the meta-universe. Users can use their own virtual images to try on clothes and lipstick shades in the metaverse, and in the real world they can have a satisfying fitting experience in person without having to leave home. In the metaverse, the electronics industry will also appear in the form of a game, creating a new way of shopping and living through an immersive experience that allows consumers to enjoy games and entertainment in the same way they shop. In addition, the meta-universe does not have to have a separate economic system; one can continue to use WeChat Pay, Alipay, or use digital RMB in the meta-universe, which is highly linked to reality.

Meta-universe+virtual assets: All users can build their own virtual assets in the meta-universe, such as purchasing properties and owning their own virtual three-bedroom apartment. Perhaps in the future, you can purchase a villa, an office building, a field, etc. In short, the virtual assets purchased in the metaverse may be exchanged for assets or funds in the real world in the future.

In summary, the door of the meta-universe world has been opened, and it will certainly have a real relationship with the world in the future, and the meta-universe for the e-commerce industry; perhaps there is a greater possibility of creating miracles in the future; the meta-universe may help the e-commerce industry to create more sales miracles, including the virtual world transactions, the future, and meta-universe+e-commerce, worth waiting for.

1.1.3 The Challenges of E-Commerce Development Under the World's Great Changes

1.1.3.1 International Perspective

This sudden outbreak of a new coronavirus has had a profound impact not only on the global political and economic order but also on the development of the global economy and trade. The outbreak has affected the supply and cooperation of the global supply chain, with the shortage of upstream raw materials, shortage of core components, rising production costs, and weak downstream consumer demand, affecting exports of general-purpose products. Some companies have taken measures to accelerate industrial restructuring in order to avoid regional risks. Being affected by many factors such as the global economic recession, social instability, and uncertainty is also increasing. The reconfiguration of international relations and international order, increased employment pressure, and restrictions on the mobility of talent

have impacted many of the development factors of the digital economy. Overall, the systemic risks of the world economy have risen, trade protectionism has further increased, geopolitical conflicts have further intensified, and the international environment facing the development of the digital economy has become more complex and the challenges more severe.

Currently, the world is in the midst of unprecedented dramatic changes, with the unprecedented rapid growth of emerging economies and developing countries, new technological and industrial changes that will lead to unprecedented metabolism and fierce competition, and an unprecedented maladaptive and asymmetric global governance system. The worldwide epidemic of Neoconservatism has exacerbated profound changes in the world's economic, technological, cultural, security, and political landscapes. The global economy has entered the largest post-World War II depression. In such an environment, with new forms of e-commerce, online education, telemedicine, telecommuting, and other new forms of booming, traditional industries have accelerated their digital transformation, and the digital economy has become an important force to support economic development under the epidemic. The focus of development in each country is gradually changing from the quantity and quality of land, manpower, and machines to digital technology and digital development, accelerating from physical space to digital space, and soon forming a digital space as the dominant form of a pattern, and the digital economy will be an important way of economic recovery and economic transformation in each country.

1.1.3.2 China Perspective

In June 2018, Xi Jinping, general secretary of the CPC Central Committee, pointed out at the Central Foreign Affairs Work Conference that “at present, China is in the best development period in modern times, and the world is in a major change unprecedented in a century, with both intertwined and mutually stirring.” In the report of the 19th Party Congress, Xi Jinping made a scientific judgment on the strategic environment of China's development, “At present, the situation at home and abroad is undergoing profound and complex changes, and China's development is still in an important strategic opportunity period, with a very bright future and very serious challenges.” The “change” of the big change has three basic lines: the new round of scientific and technological revolution and industrial change reshape the competitiveness of countries and the global competition pattern; the ebb of economic globalization and the contraction of global supply chain adjustment promote the reorganization of the global economic governance system; the change of international power contrast and the intensification of the great power game are the biggest uncertainties in China's external environment. The global pandemic of Newcastle pneumonia that broke out in early 2020 accelerated this change and made the external environment for China even more complex and severe. During the “Double 11” period in 2020, the volume of cross-border e-commerce transactions and peak list processing per second reached record highs, and data from the General Administration of Customs (GAC) showed that the country's cross-border e-commerce transactions grew steadily through the

“Double 11” period. The data from the General Administration of Customs shows that the country’s cross-border e-commerce import and export unified version of the system handled a total of 52.27 million import and export lists, an increase of 255% over the previous year: the peak processing list reached 3407 votes per second, an increase of 113.2%. Cross-border e-commerce supervision methods continue to innovate. The General Administration of Customs has added “9710” and “9810” trade methods, extended the results of cross-border e-commerce regulatory innovation from B2C to B2B, and implemented “one registration, one point docking, priority apricot inspection, allowing the transfer of customs, and Facilitate the return of goods”, and other customs clearance facilitation measures. From September 1, 2020, the pilot project will be further expanded to 22 customs offices. During the epidemic, the General Administration of Customs promptly issued 10 measures to support the development of China-EU trains, and to support the use of China-EU train capacity to carry out cross-border e-commerce, mail, and other transport business. The postal department was supported to open temporary mail routes in and out of the country, and a total of 15 temporary outbound ports and 13 temporary inbound ports were opened to actively evacuate inbound and outbound mail and cross-border e-commerce goods.

Cross-border e-commerce independent stations have emerged. In 2020, the number of global social media users reached 4.2 billion, with an annual growth rate of 13%. In the background of the booming development of social media, relying on social private domain traffic and the multi-channel online shopping habits of overseas users, cross-border e-commerce stand-alone stations have emerged. Cross-border e-commerce independent station has very unique competitive advantages; one is able to highlight the influence of the brand, which is conducive to users can better judge and identify, improve the stickiness of users to improve the purchase rate of products; second is convenient for users to collect and use user information on their own, and carry out a variety of promotional activities such as membership management and points discount; third is more rapid station building tools, greatly reducing the threshold of the company’s station building. Cross-border e-commerce independent stations are developing rapidly, and 2020 has become an important turning point in the development of cross-border e-commerce multi-channel, multi-platform, and branding.

With China’s huge population and huge domestic demand, coupled with the popularity of the Internet and smartphones, and the guidance and support of the government, China’s e-commerce is developing rapidly. However, as the domestic market becomes increasingly saturated, domestic e-commerce companies are turning their attention overseas. The Chinese government has taken proactive measures at the global level to stabilize the epidemic in a timely manner, taking the lead in resuming work, jobs, production, and schools, bringing a large amount of resources to Chinese cross-border e-commerce companies, and creating a “time gap” and “timing gap” to maintain and expand the international market. China’s cross-border e-commerce has undergone great changes and is also facing many new challenges.

1.2 E-Commerce Development History

1.2.1 China Development History

See Fig. 1.7.

1.2.1.1 Budding Period (1997–2002)

In 1997, China Chemical Information Network officially provided services on the Internet, pioneering the online chemical industry. In December, ChinaChemNet (English version) was officially launched, becoming the first vertical B2B e-commerce commercial website in China. Made in China (English version) was launched in Nanjing in February 1998. Alibaba was officially established in Cayman in December 1998. In March 1999, China's Alibaba was founded in Hangzhou, China, and in June of the same year in the Cayman Islands. The country's first C2C e-commerce platform 8848 was officially launched in May 1999. In August of the same year, eBay was launched, and in September 1999, China Merchants Bank was the first bank to launch its nationwide online banking service, "Ynetong", and in November, Dangdang was officially launched. During this period, China's e-commerce industry was still in the early stage of development, the real Internet application market had not yet taken shape, and the development of e-commerce was still very immature, while the development of online retail was just the beginning. eBay was listed on NASDAQ in June 2000, and in 2002, eBay acquired 33% of it's shares for \$30 million. But at this time, China's Internet was growing by leaps and

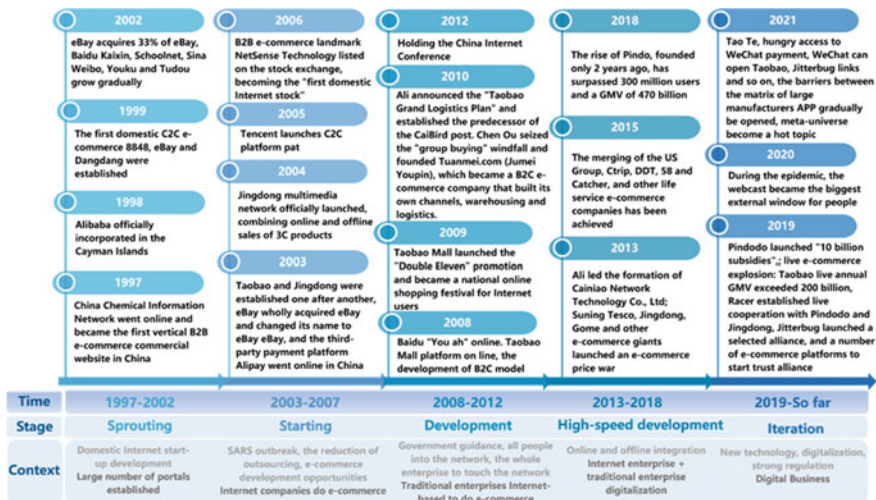


Fig. 1.7 China's e-commerce development history

bounds. Baidu defeated Google, which was calling the shots in Europe and America, and Tencent QQ, which was transplanted from ICQ, dumped MSN and created an empire. Happy.com, Schoolnet, Sina Weibo, Youku, and Tudou could grow with impunity.

1.2.1.2 Start-Up Period (2003–2007)

In 2003, Taobao and Jingdong, two of the most influential companies in the history of Chinese e-commerce, were born. The competition between eBay and Taobao was the first fierce competition in the history of the Internet, and Taobao, with its free strategy, competed with eBay for three years. During this period, C2C gradually became the main business model for traditional B2C and C2C in China. Taobao, Alibaba's C2C trading platform, was officially launched in May 2003; in June, eBay wholly acquired eBay and renamed it eBay; in August, Amazon acquired Excellence for \$75 million, officially entering the Chinese market; in October, Alipay was officially launched as a third-party. In 2004, Jingdong Media Network was officially launched to sell 3 C products in both online and offline formats. Tencent launched its C2C platform, Pai Pai, in September 2005. In December 2006, NetSense was officially listed as a national B2B e-commerce representative, becoming a "national Internet company". After the listing, the company created a new development model of "small portal+alliance", which became a new trendsetter in the development of e-commerce in China.

1.2.1.3 Development Period (2008–2012)

In 2008, Baidu "You ah" online. With the sinking of eBay, Baidu Ali Tencent three giants began to compete together for the C2C market; in April, the Taobao Mall platform was launched to develop the B2C model; in 2008, China became the world's largest number of Internet users, and e-commerce transactions exceeded 3 trillion yuan; in 2009, the number of online shoppers exceeded 100 million. In 2010, Ali announced the "Taobao Grand Logistics Plan" and established the predecessor of the CaiBird post; Chen Ou seized the "group buying" windfall and founded TuanMei.com (Jumei Youpin), which then became a B2C e-commerce company that built its own channels, warehousing, and logistics. In September 2012, the China Internet Conference was held with the theme of "Openness-Integrity-Integration-Meet the New Era of Mobile Internet".

1.2.1.4 High-Speed Development Period (2013–2018)

Ali led various logistics companies and capital financial institutions to establish Cainiao Network Technology Co. in May 2013 and positioned it as a social collaboration platform; from 2011 to 2014, the e-commerce business continued to grow rapidly,

with e-commerce giants such as Suning Tesco, Jingdong, and Gome launching the most intense price wars and the industry developing rapidly in the midst of fierce competition. In 2015, major e-commerce platforms began to unite. In 2018, Poundland emerged strongly, and in just two years, its number of users exceeded 300 million and GMV exceeded 470 billion.

1.2.1.5 Iteration Period (2019–Present)

In 2019, Poundudo launched “10 billion subsidies”, which became an important meaningful marketing activity in the development of e-commerce and also set off a new round of competition in the field of e-commerce; e-commerce live broadcast exploded in full swing: Taobao live broadcast one-year GMV exceeded 200 billion, Racer and Poundudo, Jingdong, Jitterbug, and many other e-commerce platforms formed a mutually beneficial alliance, and there was a new change in the field of e-commerce. In the year 2020, when the epidemic broke out, online live streaming became the biggest window for external communication. In January, the construction of Mount Thor and Mount Vulcan was watched via live webcast. In February, classes resumed across the country, students live-streamed cloud classes, and adults began cloud meetings. In March, bookstores were live-streamed, travel was live-streamed, houses were live-streamed, and live cloud shopping was live-streamed, all of which were household names. In April, the first anchor set a new record for live streaming. The e-commerce platform has become the hottest topic in 2020. Jitterbug e-commerce opened its first Chinese New Year rush festival on January 4, 2021. On April 13, 2019, Tmall released on annual opening of the new rules that merchants into the Tmall will simplify the qualification review of the store, replaced by a seven-month trial run. The president of Racer Electric officially released the “Windmaker” program on February 22, aiming to create 100 service providers with annual GMV over 1 billion and 200 service providers with GMV over 100 million. On August 24, Jindo announced that it would set up a special agricultural technology project with a specific amount of 10 billion yuan. On September 9, the Ministry of Industry and Information Technology organized an “administrative guidance meeting on network shielding”, requiring Ali, Tencent, Byte, Baidu, and other companies to follow the relevant regulations from September 17 onwards. The regulations will be dealt with. In the next three months, the major powers have started their own plans. Tao Te, Hungry, WeChat, Taobao, and Jitterbug, the barriers between the major APPs, are slowly being broken down. The meta-universe is the hot spot in 2021. On October 19, the president of Alibaba XR took the meta-universe as the theme, with the theme of “Meta-universe: Next Generation Internet”; on December 16, Xiaohongshu launched a special rectification action against “false marketing”, and the first 29 brands suspected of false marketing were banned.

1.2.2 International Development History

The traditional business model has also been reformed and developed with the stimulation of economic growth by e-commerce. At present, e-commerce has taken up a large share of the world economy, and its development has also received great attention from countries all over the world, which is not only manifested in the planning of national blueprints for e-commerce development but also in the efforts of countries to achieve inter-country e-commerce cooperation.

1.2.2.1 The United States

The United States is the first country in the world to develop e-commerce, and also the most mature country in the development of e-commerce, whose e-commerce development has roughly gone through four stages (Fig. 1.8).

The first stage was 1991–1994, the budding period of e-commerce; the U.S. government opened the Internet to society and proposed to build the information superhighway plan, the network infrastructure construction was rapidly promoted, and many Internet companies emerged.

The second phase was from 1995 to 1999, when B2C emerged; Amazon was founded in July 1995 and had 18 million customers by 2000, with annual sales reaching \$3.1 billion. During this period, the U.S. government successively formulated the global e-commerce market framework and various tax exemption policies, released the “Global E-Commerce Platform” in July 1997, and passed the “Internet Tax Freedom Act” in 1998, which brought opportunities for e-commerce development. According to the data of the U.S. Department of Commerce, the scale of U.S. retail e-commerce in the fourth quarter of 1999 was \$5.39 billion, accounting for 0.7% of the total U.S. retail sales of social goods in that quarter.

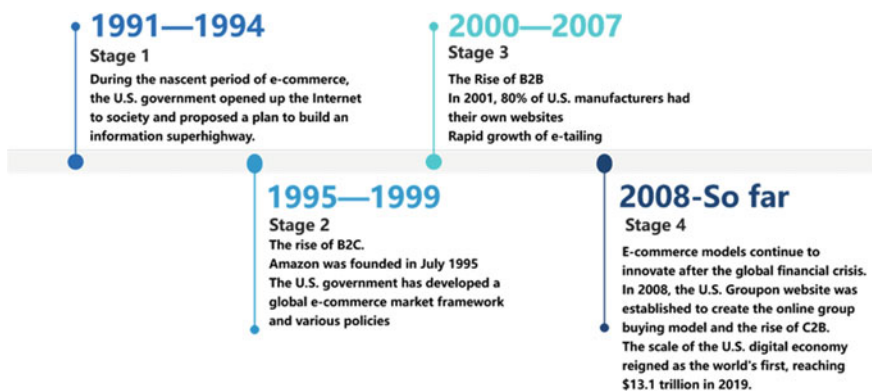


Fig. 1.8 U.S. e-commerce development history

The third phase is 2000–2007, With the development of B2B, many traditional enterprises to carry out e-commerce business to save costs and improve efficiency. In 2000, the world’s three largest automobile manufacturers joined forces to establish a dedicated online marketplace for the automotive industry, through which the annual procurement of nearly \$250 billion required parts and other commodities. According to survey data from the American Manufacturers Association, in 2001, 80% of U.S. manufacturers had their own websites, the use of e-commerce methods was 32%, and the use of e-commerce by purchasers was 38%. At the same time, the scale of e-tailing is growing rapidly. According to the U.S. Department of Commerce, the scale of U.S. retail e-commerce in 2003 was 54.9 billion U.S. dollars, up 26.3% year-on-year, 20.9 percentage points higher than the growth of total U.S. retail sales of goods in the same period.

The fourth phase is from 2008 to the present; after the global financial crisis, the world economy recovery is sluggish, the e-commerce model continues to innovate, and the impact on the overall economy continues to deepen. In 2008, the U.S. Groupon website was established, creating a network group buying model, C2B rise. According to the China ICT Academy’s 2020 New Global Digital Economy Picture, the U.S. digital economy continues to be the largest in the world. In terms of the development of the digital economy in individual countries, the U.S. is at the forefront of the global digital economy with the advantage of technological innovation, and the scale of the digital economy reigns as the world’s No. 1, reaching \$13.1 trillion in 2019.

1.2.2.2 Europe

E-commerce in Europe started in 1995, slightly later than in the United States, and its development process is roughly divided into three stages (Fig. 1.9).

The first phase covers the period 1995–1999, and the current state of Internet development in European countries is uneven. The European Union has adopted a series of initiatives to promote the development of electronic commerce. In 1997,



Fig. 1.9 European e-commerce development history

the European Union introduced the EU Action Program on Electronic Commerce, which provided a basic information architecture and basic guidelines for electronic commerce operations. In December of the same year, the European Union and the United States issued a joint statement on e-commerce, agreeing on relevant principles for cross-border e-commerce. 2000 saw the development of the E-Commerce Directive to remove technical barriers between EU countries and clarify the rights and obligations of businesses and consumers.

The second phase was from 2000 to 2007, when European e-commerce entered a phase of rapid growth. In terms of sales, Germany’s B2B turnover reached 78.3 billion Euros in 2002 and 289 billion Euros in 2005, an increase of 2.7 times; Germany’s B2C turnover reached 32 billion Euros in 2005, three times that of 2004. From the participation of enterprises and consumers, the proportion of German personal online shopping rose from 17% in 2002 to 32% in the first quarter of 2005, and the percentage of enterprises conducting online sales in 2004 was 17%; the percentage of enterprises conducting online sales in the UK in 2005 was 14.6%, up 2.6% points from the previous year.

The third phase is from 2008 to the present, European e-commerce has entered a phase of steady growth, with major countries expanding the scale of e-commerce and forming a relatively mature e-commerce market.

1.2.2.3 Japan

E-commerce in Japan started later than in Europe and the United States, but it has developed exceptionally fast, especially in the field of mobile e-commerce, and its development process can be divided into the following four stages (Fig. 1.10).

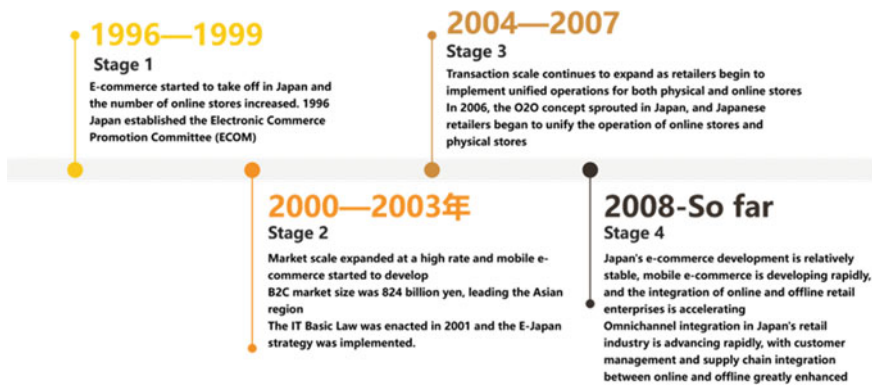


Fig. 1.10 History of e-commerce in Japan

The first phase was from 1996 to 1999, when e-commerce in Japan began to take off and the number of online stores increased. 1996 saw the establishment of the Electronic Commerce Promotion Committee (ECOM) in Japan to strengthen consultation and cooperation with the U.S. in e-commerce. According to the research of Nomura Research Institute and Keio University, more than 2,200 new online stores were opened in Japan in 1996, and more than 4,200 new online stores were opened in 1997, and by the end of March 1998, the total number of online stores in Japan reached more than 8,900.

The second phase was from 2000 to 2003; when Japanese e-commerce further developed, the market scale expanded at a high speed and mobile e-commerce started to develop. eMarketer's data showed that in 2000, Japan's B2B market scale reached 21.6 trillion yen and the B2C market scale was 824 billion yen, which was the leading level in the Asian region. In terms of the initial conditions for the development of e-commerce, Japan's computer penetration rate is lower than that of Europe and the United States, while the cell phone penetration rate is relatively high. The Japanese government attached great importance to e-commerce and promulgated various favorable policies. In 2000, it put forward the basic IT national strategy, and in 2001, it promulgated the IT basic law and implemented the e-Japan strategy.

The third phase was from 2004 to 2007; when e-commerce in Japan grew further, the scale of transactions continued to expand, and retailers began to implement unified operations between physical stores and online stores. According to the Ministry of Economy, Trade and Industry of Japan, in 2004, the size of Japan's B2B market reached 102.7 trillion yen, up 33% year-on-year, with a growth rate of 34% points lower than the previous year; the size of the B2C market reached 5.6 trillion yen, up 28% year-on-year, with a size 87.5 times that of 1998. In 2006, the concept of O2O sprouted in Japan, and Japanese retailers began to unify the operation of online stores and the fourth stage is from 2008 to the present.

The fourth stage is from 2008 to the present; the development of e-commerce in Japan is relatively stable, mobile e-commerce is developing rapidly, and the integration of online and offline retail enterprises is accelerating. In terms of market size, in 2014, Japan's B2B market size reached 195.6 trillion yen, up 5% year-on-year and 2.1 times the size of 2008; the B2C market size reached 12.8 trillion yen, up 14.7% year-on-year and 1.2 times the size of 2008. In terms of mobile transactions, the mobile sales share of Japan's largest e-commerce platform "Rakuten Market" accounted for 65% of total sales in 2014, and the mobile sales of major e-commerce platforms such as Yahoo and Chikyu will account for about 50% of total sales. From the perspective of online and offline integration, since 2011, along with technological breakthroughs in research and development, Japan's retail industry has seen rapid progress in omnichannel integration, with customer management and supply chain integration between online and offline greatly enhanced.

1.3 Status of E-Commerce in China

1.3.1 Overview of E-Commerce Development

1.3.1.1 E-Commerce Transaction Volume

(1) National e-commerce transaction volume

Data from the National Bureau of Statistics show that in 2020, national e-commerce transactions reached 37.21 trillion yuan, up 4.5% year-on-year, Fig. 1.11.

By transaction subject, the transaction volume to the unit is 18.11 trillion yuan, an increase of 3.7% year-on-year; the transaction volume to the individual is 9.84 trillion yuan, an increase of 16.6% year-on-year. According to the object of the transaction, commodity transactions are 27.95 trillion yuan, up 7.9%; service e-commerce transactions are 8.08 trillion yuan, down 6.5%; contract e-commerce transactions are 1.18 trillion yuan, up 10.4%. Among them, 1.15 trillion yuan are commodity transactions, an increase of 10.9%; equity transactions are 20.60 billion yuan, an increase of 29.6%; cultural and artwork transactions are 8.229 billion yuan, a year-on-year decline of 49.2%; other transactions are 4.720 billion yuan, an increase of 38.8%.

(2) Total national e-commerce import and export

In 2020, China’s cross-border e-commerce boomed, and data from the General Administration of Customs showed that the total import and export of e-commerce nationwide reached 1.69 trillion yuan, up 31.1% on a comparable basis. Among them, exports amounted to 1.12 trillion yuan, up 40.1%; imports amounted to 0.57 trillion yuan, up 16.5%. The annual import and export lists were checked and released

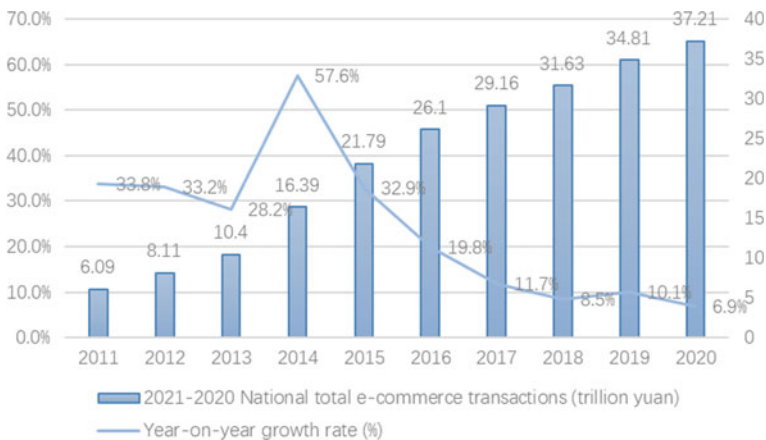


Fig. 1.11 Total national e-commerce transactions, 2011–2020. *Data source* National Bureau of Statistics

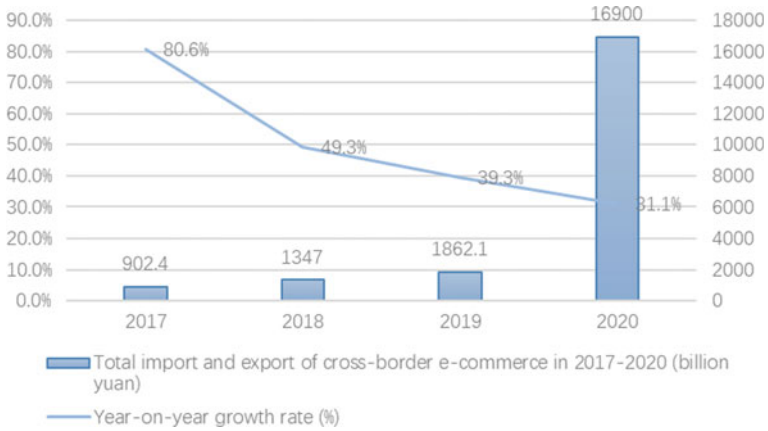


Fig. 1.12 National total import and export of cross-border e-commerce and growth rate. *Data source* General Administration of Customs

through the customs cross-border e-commerce management platform and amounted to 2.45 billion votes, an increase of 63.3% year-on-year, Fig. 1.12.

1.3.1.2 E-Commerce Development Characteristics

See Fig. 1.13.

(1) Breakthrough in electric business against epidemics

On the morning of May 22, 2020, the official opening of the third session of the 13th National People’s Congress, Premier Li Keqiang made a government work report. Li Keqiang said that e-commerce online shopping, online services, and other new industries have played an important role in the fight against the epidemic, to continue to introduce supportive policies to comprehensively promote the “Internet+” and create new advantages in the digital economy.

Li Keqiang said to optimize the private economic development environment, guarantee private enterprises equal access to production factors and policy support, and clean up and abolish unreasonable regulations linked to the nature of the enterprise. The deadline for the settlement of government agencies owed to private and small and medium-sized enterprises; to build a pro-clear government-business relationship and promote the healthy development of the non-public economy; in addition, to promote the upgrading of manufacturing industries and the development of new industries; to significantly increase medium and long-term loans for manufacturing industries; to develop industrial Internet and promote intelligent manufacturing. New industries such as e-commerce online shopping and online services have played an important role in the fight against epidemics. We should continue to introduce



Fig. 1.13 E-commerce development characteristics

supporting policies to comprehensively promote “Internet+” and create new advantages in the digital economy. E-commerce has become a vital force in the fight against the epidemic. Since the beginning of the new coronavirus epidemic, e-commerce has played an important role in raising materials for epidemic prevention, ensuring the supply of people’s livelihood, stabilizing employment, helping to resume production and work, and solving the stagnation of agricultural products. E-commerce enterprises have actively implemented the call to “ensure stable prices, reliable quality, and orderly supply” and achieved positive results. Some e-commerce platforms have assisted local governments in building supply chain management platforms for emergency supplies, integrating information on anti-epidemic supplies with digital advantages and carrying out unified management and distribution: Hangzhou, Chengdu, and other cities have opened new channels for global emergency procurement of anti-epidemic supplies through cross-border e-commerce, relying on the construction of comprehensive pilot zones for cross-border e-commerce. Some e-commerce platforms have innovatively launched “unmanned vehicle delivery” and “contactless delivery” to provide basic living materials while avoiding close contact and ensuring consumer safety. At the same time, some platforms have also opened emergency “anti-epidemic farming” zones, integrating platform resources and uniting the strength of multiple parties to realize the supply-demand docking and the upstream channel for agricultural products after the epidemic. During the period of fighting

against the new pneumonia, the supply of goods on major e-commerce platforms was basically normal, and the prices of goods were basically in order, providing a solid material basis for the masses to fight against the pain.

The online retail industry first regained its vitality. In the country's fight against the new coronavirus, important strategic results were achieved, and the online retail industry developed rapidly, leading to rapid growth in consumption. Despite the decline in GDP growth and total retail sales of consumer goods in 2020, online sales showed positive growth for the first time in April this year, and the share of physical goods in total retail sales of consumer goods rose to 24.9% from 20.7% in 2019, showing strong vitality and dynamism as an important force driving consumption. Since the outbreak of New Crown Pneumonia, the number of people shopping through e-commerce and online supermarkets has been increasing, and merchants have expanded new channels of online sales through various forms such as small programs, WeChat communities, and live streaming with goods. At the same time, in order to stimulate economic recovery, promotional activities such as "Double 11 Online Shopping Mall" and "May 5 Shopping Festival" have been held on online platforms. Under the guidance of the Ministry of Commerce, the State Post Bureau, and other relevant departments, more than 100 e-commerce enterprises across the country launched the "Double product e-commerce festival" special, special area, through live with goods, grouping seconds, new products debut trade-in, and other forms to activate the consumption potential of the era of normalization of epidemic prevention and control. According to commercial statistics, the number of brands participating in this year's "Double Products Online Shopping Festival" reached more than 100,000, with total sales amounting to 1,825.1 billion yuan, driving national online retail sales to more than 430 billion yuan during the same period. The total sales amounted to 1,825.1 billion yuan, driving the national online retail sales to over 430 billion yuan in the same period, up 20.8% year-on-year.

(2) Explosive growth of service e-commerce

Online education and medical demand surged. In online education, the Ministry of Commerce data show that China's online education sales in 2020 grew by more than 140% year-on-year. Tencent meeting, nailing, and other office applications actively for online education services. Huawei, Jingdong, and other enterprises to launch online education classroom or teaching system to provide help for resuming school and resuming classes. Schools built online teaching platforms or cooperated with online education platforms, and consumers' willingness to consume online education products increased. Influenced by the new crown pneumonia epidemic, the number of online education users grew rapidly, and data from the China Internet Network Information Center showed that as of March 2020, the size of China's online education users reached 42.3 billion, up 22.2 billion from the end of 2018, accounting for 46.8% of the overall number of Internet users. In terms of online medical care, data from the Ministry of Commerce show that the number of online medical patient consultations increased by 73.4% year-on-year in 2020, online registration and booking were further popularized, and business models such as online treatment, online inquiries, and online pharmacies were accepted by the majority of consumers. Since the New

Crown Pneumonia epidemic, more than 10 Internet medical platforms have launched online consultation pages, mobilized more than 100,000 doctors, and more than 4 million people have consulted online. During January 24-February 25, 2020, alone, the overall number of consultations approached 10 million, and the overall demand for consultations increased 6–7 times compared with that before the Spring Festival, with the overall online consultation population growing by 25–30%.

(3) The digital life and work model come into the spring of development

Since the outbreak of Newcastle pneumonia, many enterprises have chosen to resume work and production by telecommuting, and the number of active users of mobile office platforms such as Tencent meeting and Nail has increased rapidly, providing support services for enterprises' "cloud office". In response to the dismal customer flow during the epidemic, some traditional shopping malls organized shopping guides to carry out live business in WeChat groups, small programs, or live e-commerce platforms to guide consumers to "cloud shopping". Some online travel platforms or popular scenic spots have launched "cloud tourism" services. Through the short video platform or self-built App, consumers can view the natural scenery of scenic spots through virtual reality. Restaurant chains actively explore "cloud party" services, and set up cloud rooms in some stores, so consumers can chat with friends and relatives in other cities while eating through video equipment to achieve remote gathering, opening up new scenes of consumption.

(4) Efficient application of social e-commerce

Live broadcast with goods release growth. The new coronavirus epidemic has promoted the development of the live streaming with goods model, and all kinds of people have participated in the live streaming form of e-commerce to jointly promote the development of e-commerce. According to the monitoring of business big data, from January to December this year, the cumulative number of live broadcasts on key monitored e-commerce platforms exceeded 24 million, the cumulative number of views exceeded 120 billion, the number of live goods exceeded 50 million, and the number of active anchors exceeded 550,000. Offline physical stores have gained online traffic with the help of live broadcasts, Wangfujing Department Store, Xidan Joy City, and other traditional shopping centers launched a guide, cooperation brands of multiple live broadcasts. The CEO of various industries also personally take the field for their own product endorsement, participate in the wave of live broadcasts with goods in full swing. Many levels of local party and government leaders and cadres to participate in live broadcast, promote regional brands and agricultural products. Live e-commerce with offline shopping guides, advertising endorsements, and TV shopping promotion functions optimize the pre-sales service and shopping process, upgrade the retail bargaining power and shopping entertainment experience, and have been highly recognized by the market.

Online group shopping form is more abundant. Relevant data show that the transaction scale of online collocation shopping in social e-commerce has accounted for more than 50%, becoming an important mode of pulling online shopping consumption; major e-commerce enterprises have launched online collocation businesses,

emerging in 2020, such as the Hing Shing Yousei, small goose collocation, group good goods, and other collocation platforms. Changsha became the main battlefield of Poundland and Suning's collocation. Poundland, Suning, and other e-commerce companies extended the sales channels of Poundland to the county, making the sales of agricultural products explode in a short period of time. Since the outbreak of the new crown pneumonia epidemic, the community group purchase model has developed rapidly. Starting from June 2020, platforms such as Orange Heart Preferred, Meituan Preferred, and DuoDuo buy vegetables have entered the market one after another to improve their service capacity by innovating the pre-sale model, configuring the front warehouse and optimizing the central warehouse.

Offline stores accelerate the layout of private domain traffic operations. Entity merchants actively explore online customer groups and tap potential consumption potential through online marketing by means of small programs and corporate WeChat. With the impact of the new pneumonia epidemic, consumer buying habits have changed dramatically, Most people choose online shopping at home, network sales also showed a spurt of growth, and many businesses have begun to advance the layout and want to occupy the network. The number of orders from Suning Tesco increased by 85%, mainly for fruits, vegetables, meat, and sanitary products such as sterilized water; this Spring Festival, the number of newly registered users at Wumei Multipoint increased by 2,363% year-on-year; the number of orders from Boxma Fresh Life skyrocketed, and there was even a shortage of staff. In 2020, the growth rate of the number of paid merchants of small program mall service providers Youzan and Weimeng reached 18.0% and 23.2%, respectively.

(5) Cross-border e-commerce is steadily improving

During the "Double 11" period in 2020, the volume of cross-border e-commerce transactions and peak list processing per second reached record highs, and according to the data of the General Administration of Customs, the national cross-border e-commerce import and export unified system processed 5,227 import and export lists through the Customs. According to data from the General Administration of Customs, a total of 52.27 million import and export manifests were processed through the unified system of cross-border e-commerce import and export, an increase of 25.5% over the previous year.

The regulatory model of cross-border e-commerce is also being innovated. The General Administration of Customs has added the "9710" and "9810" trade models, expanded the regulatory innovation of cross-border e-commerce in B2B, and implemented the customs clearance facilitation of "one registration, one point docking, priority inspection, allowing transit, and facilitating return". For small and medium-sized enterprises, single low-value goods can be a more convenient customs clearance channel, such as the Canton Fair, and other online exhibitions of goods can also be used. Starting from September 1, 2020, the pilot will be extended to 22 directly affiliated enterprises. During the epidemic, the General Administration of Customs has launched 10 timely initiatives to support the development of China-EU trains, supporting the capacity of China-EU trains to carry out cross-border e-commerce, mail, and other transport services. The General Administration of Customs gives full

support to postal enterprises in establishing temporary ports. So far 15 temporary ports and 13 temporary ports have been built.

Cross-border e-commerce independent station has emerged. According to data from research institutions, in 2020, the number of global social media users reached 4.2 billion, with an annual growth rate of 13%. In the background of the booming development of social media, relying on social private domain traffic, superimposed on the multi-channel online shopping habits of overseas users, cross-border e-commerce independent stations came into being. Cross-border e-commerce independent website has unique competitive advantages, one is to highlight the brand strength and influence, which is conducive to user recognition and identification, and enhance stickiness and repurchase; the second is to facilitate the independent accumulation and application of customer data, and carry out diversified marketing activities such as membership management and preferential points; the third is richer and quicker station building tools, which greatly reduces the threshold of the enterprise station building. Cross-border e-commerce independent station rapid development and 2020 is an important turning point in the development of cross-border e-commerce multi-channel, multi-platform, branding.

(6) Profound transformation of rural e-commerce

After the outbreak of the new crown pneumonia epidemic, rural e-commerce has become a powerful assistant for the sale of agricultural and sideline products and daily necessities. According to the statistics of the Ministry of Commerce in 2020, the online retail sales of 832 poor counties nationwide amounted to 301.45 billion yuan, an increase of 26% over the same period of the previous year. Online sales revenue of agricultural products in poor counties nationwide was 40.66 billion yuan, an increase of 43.5% over the same period of the previous year and 14.6 percentage points higher than the previous year. Many migrant workers and college students returned to their hometowns during the Spring Festival. Due to the epidemic, they were unable to return to school on time and achieved local and nearby employment through e-commerce. By the end of 2020, the number of online businesses in poor areas nationwide reached 3.065 million, an increase of 366,000 over 2019, or 13.7% year-on-year.

The development mode of specialty agricultural e-commerce is diverse. Rural e-commerce further promotes the development of agricultural standardization and branding. Under the guidance of the Department of E-Commerce of the Ministry of Commerce, the China Electricity Business Alliance for Poverty Alleviation has actively cultivated agricultural brands. The Ministry of Agriculture and Rural Affairs has formulated brand cultivation programs and carried out brand promotion activities, creating regional public brands, holding agricultural festivals, and introducing leading enterprises to build brands of special agricultural products. Specialties such as crawfish in Hubei, fungus in Zhashui County, Shaanxi, and mangoes in Guangxi are invested with special funds. Through the organization of festivals, brand recommendation meetings and other activities to carry out production and marketing docking play a role in bringing goods, and guide enterprises to build special industry e-commerce incubator parks. The enhancement of the scale efficiency of the regional

industry cannot be achieved without the synergistic cooperation of local governments, enterprises, associations, and other units. Liuzhou snail powder has formed a whole industry chain of raw material production, product processing, brand building, online sales, and peripheral culture and creativity, driving the production of snail powder raw material breeding within the city of Liuzhou. As of December 2020, the production and sales of bagged Liuzhou snail powder exceeded 10 billion, an increase of 68.8% over last year. Shandong Cao County's performance clothing in Taobao, Tmall platform sales share has exceeded 70%, and the formation of one of the country's largest performance clothing industry clusters. Yiwu City, relying on e-commerce platform to carry out online sales of small commodities, driving Yiwu and surrounding areas with the formation of a perfect small commodity industry clusters. At the end of 2020, Yiwu City has 169 e-commerce villages, becoming the largest Taobao village clusters in China.

(7) E-commerce regulations continue to improve

In the Internet era, the legal relationship reflected by data elements has become the key to e-commerce laws. E-commerce laws have played a protective role in building fair and orderly rules for data transactions and competition, and correctly identifying the boundaries and responsibilities of online platforms, etc. The judiciary's application and implementation of the existing system and exploration of new regulations have shown the following four characteristics (Table 1.1).

Regulate the order of the e-commerce market. In response to consumers' strong reaction to the chaos in the field of live streaming and complaints from merchants about the platform's "second choice" and other prominent issues, relevant departments issued policies to improve the regulation of the new live-streaming e-commerce industry and implement anti-monopoly investigations. Official website released the Notice on Strengthening the Management of Live Network Show and Live E-Commerce, in which multiple departments jointly promoted the regulation and supervision related to live e-commerce, and rectified the problems of brush-ups and speculation, counterfeiting, and poor service support in the live e-commerce industry. On November 10, 2020, the General Administration of Market Regulation (GAMR) solicited public comments on "the Anti-monopoly Guidelines in the Field of Off-dry Platform Economy (Draft for Comments)", and on November 10, 2020, the General Administration of Market Regulation (GAMR) launched an anti-monopoly investigation into the "buy one get one free" behavior of several e-commerce platforms in accordance with the law.

Accelerate the innovation of public services. The Ministry of Commerce promoted the sharing of e-commerce data between the Ministry and provinces, and established a statistical monitoring and analysis system. Innovation to carry out "e-commerce public services for the people and enterprises", in the continuous optimization of the national e-commerce public service platform on the basis of existing services, integration, and a number of high-quality social service resources, free and open to the majority of e-commerce enterprises to use. By the end of 2020, 10 e-commerce public service partners have joined, covering data analysis, e-commerce training, integrity building, talent recruitment, market consulting, and many other aspects.

Table 1.1 Legal development characteristics of electronic commerce

<p>Continuous improvement of intellectual property protection rules in cyberspace</p>	<p>In order to improve the rules of intellectual property protection, delineate the boundary of protection of new technology applications, strengthen judicial protection of innovation achievements, and stimulate the market vitality of the digital economy, “the Patent Law”, “the Tort Liability Law”, “the E-Commerce Law”, and other laws and regulations have provided for the protection of patent rights in the network environment</p>
<p>Continuously establish the rules of network transactions</p>	<p>Due to the complexity and diversity of online transaction cases, in order to regulate the order of Internet commercial competition and optimize the business environment of the digital economy, the judiciary has continued to establish the rules of online transactions through jurisprudence on the basis of the “E-Commerce Law”</p>
<p>Constantly fighting monopolies and unfair competition</p>	<p>Unfair competition occurs in the e-commerce industry from time to time. “The Anti-monopoly Law” and “the Anti-Unfair Competition Law” restrain and regulate unfair competition within and between e-commerce platforms</p>
<p>Continuously strengthen personal information and data security protection</p>	<p>In recent years, in order to protect the security of personal data information and regulate the market of data elements in the digital economy, relevant laws and regulations have been introduced intensively, covering all levels of the Chinese legal system. For example, “the Personal Information Protection Law” and “the Network Security Law”</p>

Local governments are also actively exploring public services for the e-commerce industry and accelerating resource integration, and research and development of industrial support policies to improve the public service system.

Promote the construction of a demonstration system. In 2020, national e-commerce demonstration base creation activities continue to carry out in-depth; the new addition of 15 national e-commerce demonstration base, and the number of national e-commerce demonstration base expanded to 127. The comprehensive evaluation results show that the 127 national e-commerce demonstration bases have stationed more than 650,000 e-commerce and related enterprises, up 13.9% year-on-year; total e-commerce transactions reached 56 trillion yuan, up 29.3% year-on-year; 1.327 million employees, up 7.0% year-on-year; 95% of the demonstration bases have carried out e-commerce poverty alleviation, helping local communities solve difficulties such as stagnant agricultural products. Under the guidance of the Ministry of Commerce and other relevant departments, they accelerate industrial integration, industrial support policies, and sound public service system, build a mechanism for cooperation between industry, academia, and research, build a

good e-commerce demonstration base in the cultivation of small and medium-sized enterprises, stimulate the application of new technologies, promote model innovation to help precise poverty alleviation and digital transformation of traditional industries, and drive entrepreneurship, and employment played an important role. They organized the establishment of e-commerce demonstration units, developed the “e-commerce demonstration enterprise creation specification” and “e-commerce demonstration enterprise selection (comprehensive evaluation) index system”, and organized the creation of e-commerce demonstration enterprises according to five types of e-commerce platforms, e-commerce brands, e-commerce services, integrated e-commerce, and other innovative e-commerce enterprises to encourage and guide e-commerce enterprises to promote integration, livelihood, development, environment, openness, and the high-quality development of e-commerce. In accordance with the decision and deployment of the Party Central Committee and the State Council, the Ministry of Commerce has taken the lead in the development of a digital economy in the context of the development of a new idea of developing digital commerce, strengthening top-level design and theoretical research, and formulating the “Guidelines for the Development of Digital Commerce Enterprises (Trial)”. The development of digital business enterprises will further stimulate the development of enterprises using modern information technology, accelerate data empowerment, and guide the development of market players in the direction of digitalization, networking, and intelligence.

(8) Silk Road e-commerce solidly promoted

Enrich the level of cooperation in silk road e-commerce. China has signed strategic cooperation memorandums with 22 countries on “silk road e-commerce” and established bilateral cooperation mechanisms with partner countries on this basis. We are expanding the scope of cooperation and increasing the confidence of both sides. In 2020, we organized working group meetings, government-enterprise dialogues, and roundtable meetings to strengthen policy exchanges with partner countries and promote local economic ties and business cooperation. We supported our partners such as Italy and Chile to set up “national pavilions” in major e-commerce platforms in China, and significantly increased the sales of special products from Austria, New Zealand, Cambodia, and Rwanda in the “Double Commodity Online Shopping Festival”. In order to innovative cooperation mode, China invited domestic experts to give online lectures at “Silk Road E-Commerce” lecture hall, including policies, regulations, development trends, innovative practices, operational skills, etc. which is well received by partner countries. The “Silk Road E-Commerce” cloud lecture hall has been held 35 times since the fourth quarter of this year, and more than 100,000 people have attended the online courses. We are actively promoting major e-commerce enterprises to give full play to their procurement channels and logistics networks to provide strong support for the prevention and control of the epidemic in the countries concerned, and actively provide policy guidelines and constantly update the control measures of 192 countries and regions, so as to provide good services for enterprises to resume work and carry out cross-border e-commerce business.

Promote the construction of international rules for e-commerce. On November 15, 2020, the Regional Comprehensive Economic Cooperation Agreement (RCEP) between the three major economies of East Asia and the major economies of South-east Asia was officially signed. This agreement was started by ten ASEAN countries in 2012, inviting six countries, including China, Australia, India, Japan, South Korea, and New Zealand, to participate together. The RCEP e-commerce chapter is the first extensive and high-level result on e-commerce rule-making in the Asia-Pacific region, involving the promotion of e-commerce utilization and cooperation, with the main contents including the promotion of e-commerce application and cooperation, including the promotion of e-commerce, e-authentication, and e-signature, protection of personal information of e-commerce users and online consumers' rights and interests, strengthening of regulatory cooperation on involuntary commercial electronic information, etc. It will provide institutional safeguards for countries to strengthen cooperation in the field of e-commerce, help create a favorable environment for e-commerce development, enhance mutual trust in policies, mutual recognition of standardization, and interoperability of enterprises in the field of e-commerce among members. International cooperation in e-commerce ushers in a new period of opportunity.

1.3.2 E-Commerce Architecture

E-commerce after continuous development has now been relatively mature, e-commerce systems are increasingly large and complex, and people's understanding of e-commerce has become more and more in-depth with the development of e-commerce itself.

Classification is a way for people to understand and manage things. The concept and connotation of e-commerce is quite rich and complicated. In order to enable readers to have a deeper understanding of e-commerce, this book classifies it from the perspectives of channels (network), people, goods and fields through innovative classification methods, and sorts it out on the basis of each classification. The detailed content is in Chapter 5.

1.3.2.1 Channel (Network) Perspective Classification

From the perspective of channel (network), the classification is divided into four categories according to the use of network: EDI, Internet e-commerce, Intranet (Intranet) e-commerce, and mobile e-commerce. This classification reflects the course of Internet development.

In recent years, due to the rapid development and popularity of mobile electronic products, e-commerce based on mobile networks has gained new development opportunities and development space. Mobile e-commerce is an innovative way of doing

business, which has the advantages of traditional e-commerce development based on the use of cell phone network and consumer upgrading.

1.3.2.2 Human Perspective Classification

In addition, the rapid development of new technologies such as big data, blockchain, and artificial intelligence has allowed more businesses to get closer to consumers' inner demands. In addition, the traditional model of manufacturers and retailers dominating the value chain is no longer sustainable. From the perspective of people, this book classifies e-commerce transaction modes into B2B (business to business), B2C (business to consumer), C2B (consumer to business), C2C (consumer to consumer), and O2O (online to offline) according to the transaction objects of e-commerce activities.

1.3.2.3 Classification of the Perspective of the Goods

Currently, with the normalization of the prevention and control of the new pneumonia epidemic, live e-commerce, fresh takeout, instant delivery, and other "house economy" have been developed at a high rate. The "house economy" driven by the new industry on China's warehousing and logistics industry has put forward new requirements. Therefore, relying on the strong support of national policies and their own advantages, large express delivery enterprises have accelerated the layout of high-standard storage facilities across the country, and gradually become a new force to be reckoned with in China's warehousing and logistics market. E-commerce small batch, multi-style, fast turnaround demand characteristics, the supply chain service capacity, and delivery time requirements are increasingly high. E-commerce warehousing customers have sunk their goods in advance to improve distribution speed, such as binning products to front warehouses close to consumers before the live broadcast, to enhance the distribution speed by sending multiple warehouses nationwide. From the perspective of goods, this book classifies e-commerce into front warehouse type e-commerce, origin warehouse type e-commerce, and sales place warehouse type e-commerce.

1.3.2.4 Field of View Classification

With the rapid development of e-commerce and the popularity of the network, people's widespread use of the network, and the need for capital flows, there will be broad development prospects, which will gradually break the barriers to payment services, interconnection into a new stage of development. Third-party payment is a new technology, a new industry, and a new model. In 2021, third-party platforms

represented by Alipay and WeChat Pay will take the lead in opening up to payment institutions such as Cloudflare, and promote deeper interconnection at the online and offline scenes, payment, and service levels. According to the development history of e-commerce platforms, this book classifies e-commerce as first-party platform, second-party platform, and third-party platform e-commerce from the perspective of goods.

1.3.3 Emerging E-Commerce Model

In the “14th Five-Year Plan”, a programmatic document issued by the Central Internet Information Office to guide the development of China’s information technology in the next five years, the country has included the promotion of new business models such as social e-commerce in its policy outline, as well as in the ten key tasks and key projects. The 14th Five-Year Plan for Business Development (hereinafter referred to as “the Plan”) released by the Ministry of Commerce of China also proposes to promote consumption in a comprehensive manner. For new types of consumption, the Plan proposes to use new technologies to create new scenes of digital consumption, cultivate more “small and beautiful” network brands, and expand the application of live e-commerce, social e-commerce, etc.

Social commerce is a new form of e-commerce, it is through social networks, microblogging, WeChat and other social media social interaction, user self-generation, and other ways to assist the sale of goods or services, while the attention, likes, sharing, comment interaction, and other social elements are applied to the transaction process of the shopping model. Social commerce is the integration of e-commerce and social media, to The social transaction model with trust as the core is the main expression of new e-commerce.

Social e-commerce includes the following four models.

Group-buying social e-commerce: low price is the core competitiveness, around two or more users, through the model of grouping and then price reduction, to stimulate users to share to form self-propagation.

Membership-based social e-commerce: S2B2C model, the platform provides goods, warehouses, distribution, after-sales service, and other industrial chain, and distribution to encourage users to become distributors, and use their own social networks to share, so as to achieve the purpose of “self-purchase” to save and share money.

Community-based social e-commerce: community-based users can register in the community and place orders through WeChat and other tools, and within a specified period of time, the products will be delivered to the head of the group so that consumers can take them themselves or let the head of the group to complete the last mile of delivery.

Content-based social e-commerce: through various types of content to influence and guide consumers to make purchases, while further understanding user preferences through content to achieve synergy between goods and content and improve marketing conversion effects.

It is a new type of e-commerce platform represented by anchors (celebrities, weblebrities, KOLs, KOCs, creators, etc.) that promote products through live streaming to achieve the effect of “quality and efficiency”. We can understand this concept from the following four perspectives: first, live e-commerce is a new media combined with traditional forms of e-commerce; second, the anchor members come from a wide range of sources, whether they are celebrities, weblebrities, KOLs, KOCs, creators, or even government officials, and can become anchors; third, the transaction efficiency of live e-commerce will be greatly improved far beyond the past; fourth, it can better “quality and efficiency”. The live e-commerce not only can better complete the transaction but also through the establishment of consumer values achieve the spread of the brand.

The essence of live e-commerce is to upgrade consumption. In today’s society, where things are scarce, people are accustomed to consuming according to the value and functional parameters of the product, rather than based on the value of the product, while consumers are more focused on the overall psychological experience, and more people want to obtain more knowledgeable and professional information as a reference for decision-making. Therefore, the essence of live e-commerce is the upgrading of consumption, and behind the upgrading of consumption is the continuous improvement of users’ needs, while live e-commerce, through consumption data and consumer orientation, will be closer to the delivery of goods, emotions, and human nature, so as to better meet the needs of users.

The main characteristics of live e-commerce are as follows: First, the interactive ability. The live e-commerce platform is a “live+live+interactive” model, which allows anchors and users to communicate on a single platform, allowing everyone to communicate with the anchors in real time, which is much better than the previous e-commerce and social platforms, and easier to win the trust of users. The second is the powerful characteristics of IP, I (intellectualproperty) is the abbreviation of intellectual property, that is, the host has not only a strong IP characteristics and a unique identity in the hearts of users but also a kind of emotional support. Third, it is highly fragmented. On the one hand, the number and variety of hosts on the e-commerce platform is much larger, and the hosts themselves have their own fans, so compared to e-commerce, live e-commerce is more decentralized and offers more opportunities and possibilities to more hosts.

1.4 Summary of this Chapter

E-commerce in China continues to develop rapidly and various new business models are emerging, playing an important role in enhancing the vitality of economic development, improving the efficiency of resource allocation, promoting the transformation and upgrading of traditional industries, and opening up employment and entrepreneurship channels. This chapter reviews the development process of e-commerce from agricultural economy, industrial economy to digital economy. Currently, the new coronavirus epidemic is still spreading globally, the global economy is in the doldrums, and trade protectionism, unilateralism, and anti-globalization thinking are on the rise, bringing unprecedented risks and challenges to our development. In the fight against the new coronavirus, e-commerce has made full use of the advantage of “non-contact” to create more new forms of online services, speeding up the digitalization process of the whole society and showing strong vitality and resilience. As the prevention and control of the new pneumonia epidemic enters a normalized phase, e-commerce will continue to play a pioneering and strategic role in the modern circulation system and become a key force in building a new development pattern. This chapter analyzes the challenges of e-commerce development under the major changes in the world from both international and Chinese perspectives, and summarizes the opportunities for e-commerce development in the new era from three levels: policy, market, and technology.

This chapter constructively summarizes and composes the development history of international and Chinese e-commerce, and divides the development history of Chinese e-commerce into five stages: the budding period, the start-up period, the development period, the high-speed development period, and the iteration period. At the same time, the innovative classification is made from the perspective of channel (network), people, goods, and field. This chapter takes a macro perspective to understand the emerging e-commerce model. Social e-commerce has the unique advantages of discovery buying, decentralization, rich scenarios, and strong user stickiness compared with traditional e-commerce, which can not only help traditional enterprises solve their sales problems, and greatly improve the operational efficiency of their online channels, but also become an effective channel to help farmers. E-commerce will continue to play an important role in the process of promoting rural development.

During the “14th Five-Year Plan” period, e-commerce development will continue to be guided by Xi Jinping’s thought of socialism with Chinese characteristics in the new era, fully implement the decisions and plans of the Party Central Committee and the State Council, adhere to the general keynote of seeking progress in a stable manner, adhere to the new development concept, high-quality development, and the main line of supply-side structural reform, further promote the integration and innovation of e-commerce, promote inclusive and balanced development, strengthen international cooperation, and deepen the market allocation of factors, improve the management level of e-commerce, and promote the comprehensive development of e-commerce into a new stage of high quality.

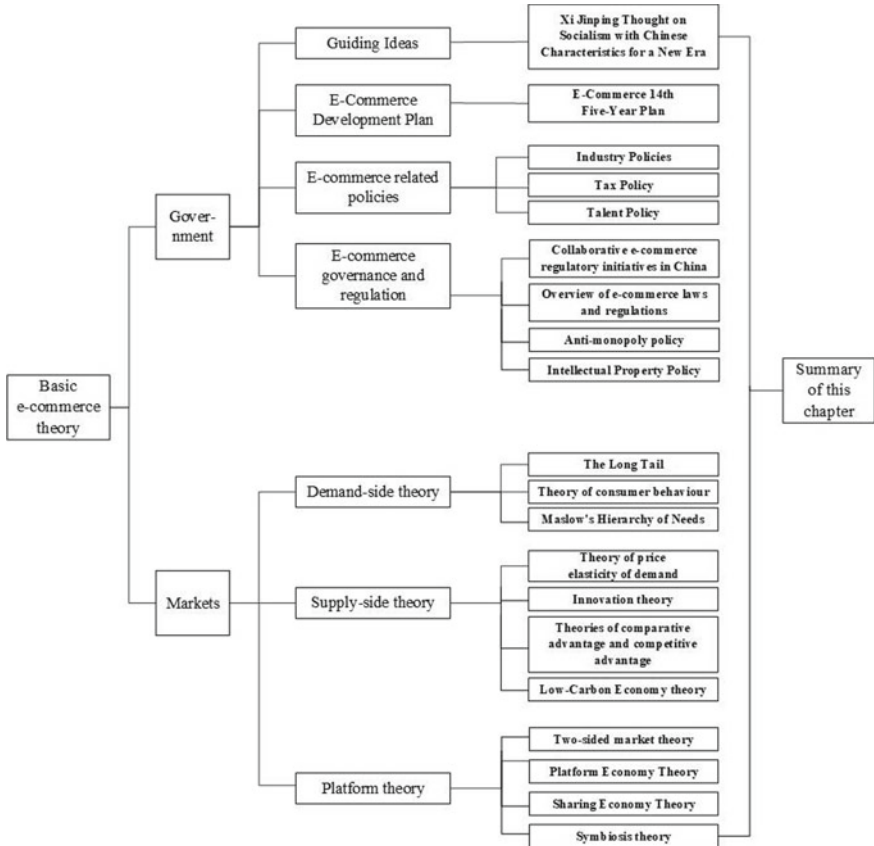
1.5 Review Reflection Questions

1. Based on the perspective of agricultural economy, industrial economy, and digital economy, briefly describe the development of e-commerce and technological change.
2. What are the factors of production, core driving forces, and important vehicles of the digital economy?
3. According to the development process of digital economy technology and related industries, into which periods can the development of digital economy be divided?
4. From both international and Chinese perspectives, briefly describe the challenges of e-commerce development under the world's major changes.
5. Briefly describe the stages of e-commerce development in China in the light of landmark events.
6. Briefly analyze the similarities and differences of e-commerce development in China, the United States, Europe, and Japan based on the development history of e-commerce in China, the United States, Europe, and Japan.
7. Briefly describe the major characteristics of e-commerce development.
8. What are the three unique competitive advantages of cross-border e-commerce independent stations?
9. What are the characteristics of the legal development of e-commerce?
10. Briefly explain how the book is classified based on channel (network), people, goods, and field perspective.
11. Talk about your perceptions of e-commerce development with specific events.

Chapter 2 Basic E-Commerce Theory



Knowledge Map of this Chapter



Introductory Case

In 2022, in order to thoroughly implement the decision and deployment of the Party Central Committee and the State Council; give full play to the advantages of e-commerce in linking production and consumption, online and offline, urban and rural areas, and domestic and foreign; coordinate the prevention and control of epidemics and the promotion of Chinese New Year consumption; and ensure that the people spend a safe, healthy, joyful, and peaceful Chinese New Year festival, the Ministry of Commerce, together with the Central Internet Information Office, the Ministry of Industry and Information Technology, the General Administration of Market Regulation, the Ministry of Commerce, together with the Central Internet Information Office, the Ministry of Industry and Information Technology, the General Administration of Market Regulation, the State Post Bureau, and the China Consumers' Association, will guide e-commerce and related enterprises in organizing the 00222022 National Online Chinese New Year Festival", which will follow the principle of "government guidance and market-oriented operation" and follow the national "one piece" approach. The event will follow the principle of "government-directed, enterprise-oriented, and market-based operation" and will be carried out in accordance with the "1 + N" organizational model of "one chessboard" and key regions as a whole. On the whole, the "New Year's Eve Festival" showed the following characteristics.

First, the goods and services category supply enough. All regions will guide the e-commerce platform enterprises to ensure that rice, noodles, oil, meat, eggs, milk, fruit, vegetables, and other important livelihood commodities and epidemic prevention materials supply sufficient. At the same time, more branded, quality, healthy, and smart products will be introduced, as well as catering packages and customized New Year's Eve dinners suitable for different groups of people, and services such as "online booking, delivery to home", and "no closing time for the Spring Festival, New Year's Eve goods sent home" will be provided.

Second, the supporting activities are fancy and unique. All places regard "New Year's Eve" as an important platform to promote consumption and industrial development and come up with real tricks to carry out supporting activities.

Thirdly, the policy measures are sufficient and beneficial. Focusing on food, accommodation, travel, tourism, entertainment, and shopping, some places and enterprises are increasing their promotion, marketing, and service efforts through various forms of concessions. Participating platform companies will also launch new product debuts, trade-ins, full discounts, seconds, direct reductions, and other activities to increase investment, so that consumers can really get the benefits.

Fourth, consumer rights protection is strong and the environment is excellent. All kinds of activities participating in the “New Year’s Eve” will be marked with a unified logo, so that consumers can see it at a glance. The Ministry of Commerce will jointly guide the unit, in accordance with the division of functions, to ensure the high quality of rich commodities, digital business environment, good business standard order, smooth and timely delivery, and consumer rights protection.

Fifth, the epidemic prevention and control measures are real and more powerful. All regions will urge and guide the enterprises participating in the “New Year’s Eve” to strengthen the main responsibility of epidemic prevention and control, strengthen personnel protection and daily monitoring, and standardize the epidemic prevention procedures in the process of warehousing, sorting, and distribution of commodities, especially the strict implementation of the whole process of cold chain epidemic prevention measures. At the same time, new terminal retail facilities were brought into full play to reduce contact between personnel and reduce the risk of epidemic transmission.

Consider:

1. What are the five characteristics of the “New Year’s Eve” that have brought convenience to people’s lives?
2. What roles do the government and the market play in the New Year’s Eve festival?

There have been three industrial revolutions from the age of the steam engine to the information age, and these three industrial revolutions have greatly advanced history. The fourth industrial revolution is a change between man and machine, man and intelligence. As an important force in promoting national economic and social development, e-commerce will grasp the opportunities of the fourth industrial revolution. E-commerce is characterized by the connection between the Internet and offline, the rapid upgrading of production and consumption, the simultaneous development of urban and rural areas, and the synergistic promotion of domestic and international. E-commerce will become a powerful contributor to growing the domestic market, enhancing the discourse in the international market, and promoting new development to build a new pattern. In order to bring into play the comparative advantages of the e-commerce sector, an “effective market” and a “responsive government” need to work together.

An “efficient market” means that the market forms a price system based on the decisive role of the resource allocation method, which reflects the scarcity of factors and thus leads enterprises to choose to invest in industries and technologies that match their own development according to their comparative advantage. The formation of competitive advantage requires enterprises to give full play to their position as market players and to develop e-commerce under a series of market theories.



Fig. 2.1 The invisible hand and the visible hand work together

A “responsive government” means that under the guidance of Xi Jinping’s theory of socialism with Chinese characteristics in the new era, the government formulates a series of plans, policies, rules, and regulatory guidelines related to e-commerce. By providing enterprises with institutional arrangements and infrastructure suitable for their own development, it supports them in transforming their comparative advantages into competitive advantages.

A country can only achieve rapid, inclusive, and sustainable growth if it uses both hands, the market and the government. It is only with the combined effect of an “effective market” and a “responsive government” that enterprises can achieve longer-term development in the race track of e-commerce (Fig. 2.1).

2.1 Government

In the past, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era guided the government to use e-commerce as a supplementary tool to formulate e-commerce-related planning, policies, and regulatory rules based on the new development stage, development concept, and development pattern. By providing the right infrastructure and institutional arrangements for enterprises, the government can enhance the core competitiveness of enterprises in the e-commerce industry and optimize the e-commerce-related industries. These initiatives lay a solid foundation for deepening the integration and innovative development of e-commerce in various fields, promoting the digital transformation of the economy and society, and building a modern distribution system.

2.1.1 Guiding Ideas

2.1.1.1 Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era

The Communist Party of China, represented by Comrade Xi Jinping, has insisted on combining the basic principles of Marxism with the concrete reality of China and the excellent Chinese traditional culture, adhering to Mao Zedong Thought, Deng Xiaoping Theory, the Important Thought of the “Three Represents”, and the Scientific Development View, and profoundly summarizing and fully applying the historical experience since the founding of the Party. From the new reality, Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era has been created. Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era is contemporary Chinese Marxism and twentyfirst-century Marxism, which is the essence of Chinese culture and the Chinese spirit, has achieved a new leap in the Chinization of Marxism.¹

Under the leadership of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, the construction of e-commerce has also entered a new phase and opened up a new situation (Table 2.1).

2.1.2 E-Commerce Development Plan

2.1.2.1 E-Commerce 14th Five-Year Plan

COVID-19 has made the global environment even more complex and the Chinese Communist Party and the country have faced major challenges, but during this period the main objectives of *the 13th Five-Year Plan for E-Commerce* have been successfully completed. The booming development of e-commerce has strengthened the domestic market, driven the innovation and entrepreneurship of talents, and provided the strength to fight poverty and enhance the level of opening up to the outside world. As we enter the 14th Five-Year Plan period, e-commerce will continue to be guided by Xi Jinping thought on socialism with Chinese characteristics for a new era under the leadership of the CPC Central Committee and the State Council to achieve the development goals of the 14th Five-Year Plan period and complete the main development tasks for the 14th Five-Year Plan period.

(1) E-commerce development targets for the 14th Five-Year Plan

During the 14th Five-Year Plan period, the country has proposed new targets for the development of e-commerce in accordance with the latest developments at home and abroad.

¹ Chinese Government Net. Resolution of the CPC Central Committee on the major achievements and historical experience of the Party’s century-old struggle [R]. 2021-11-16.

Table 2.1 Building e-commerce under Xi Jinping thought on Socialism with Chinese Characteristics for a New Era

<p>(1) Adhere to the party's leadership and ensure the correct political direction for the development of e-commerce in the new era</p>	<p>The leadership of the party "is the most essential feature of socialism with Chinese characteristics and the greatest advantage of the socialist system with Chinese characteristics" and the most fundamental guarantee for socialism with Chinese characteristics to show stronger vitality in the new era. The construction and development of e-commerce should always adhere to the party's absolute leadership as the highest principle, enhance the "four consciousnesses", strengthen the "four self-confidence", and achieve "two safeguards", and the organizations, institutions, enterprises, and practitioners engaged in e-commerce should maintain a high degree of consistency with the Party Central Committee with Comrade Xi Jinping as the core in terms of political stance, political direction, political principles, and political road. Always take the people as the center as the fundamental position, the construction and development of e-commerce should take the initiative to adapt to the changes in the main contradictions in society; solve the problems of rights and interests protection, public safety, fairness, and justice that the people are most concerned about; and constantly enhance the people's sense of gain, happiness, and security. Take the overall national security concept as a strategic guide for the construction and development of e-commerce; adhere to the supremacy of people's security, political security, and national interests; and make every effort to safeguard China's social security, stability, and development interests</p>
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(continued)

Table 2.1 (continued)

<p>(2) Build a complete theoretical system to lay the theoretical cornerstone for the development of e-commerce in the new era</p>	<p>Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, clarify the new mission of e-commerce in the national economic and social development in the new era and promote the construction of e-commerce theory system based on the new development stage, the implementation of new development concepts, and the construction of a new development pattern of services. Solidly promote the construction of e-commerce scientific research institutions, the construction of e-commerce disciplines, the construction of e-commerce textbooks, the training of e-commerce talents, and the theoretical research of e-commerce. Apply the basic principles, methods, and theories of Marxism to scientific research, attach great importance to the combination of scientific research and practice, use scientific theories to guide the practice of e-commerce, and put forward new theories on the basis of rich practice, laying a theoretical cornerstone for the development of e-commerce in the new era</p>
<p>(3) Make the e-commerce industry bigger, stronger, and better and provide new momentum for the comprehensive construction of a modern socialist country</p>	<p>Adhere to the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, based on the new development stage, implement the new development concept, build a new development pattern, take the promotion of high-quality development as the theme, deepen the supply-side structural reform as the main line, take reform and innovation as the fundamental driving force, meet the people's growing needs for a better life as the fundamental purpose, coordinate development and security, based on the important positioning of e-commerce connecting online and offline, connecting supply and demand, docking domestic and foreign markets, through digital technology and data elements two-wheel drive, enhance the core competitiveness of e-commerce enterprises, make the e-commerce industry bigger, stronger, and better, deepen the integration and innovative development of e-commerce in various fields, empower the digital transformation of the economy and society, promote the construction of a modern circulation system, promote the formation of a strong domestic market, strengthen international cooperation in e-commerce, promote a higher level of opening up to the outside world, and continuously provide new momentum for the comprehensive construction of a modern socialist country</p>

The high-quality development of e-commerce in China is set to achieve significant results by 2025. The development of the e-commerce sector has improved the competitiveness of the companies involved and driven further growth in e-tailing.² E-commerce promotes the acceleration of the digital transformation of society, provides a key channel for the employment and entrepreneurship of talented people, and is an important source of raising the income of the population and meeting the needs of the people for a better life.

By 2035, e-commerce will truly be an important driver of China's economy, technology, and a significant leap in overall power. E-commerce, as a part of people's lives, will drive the efficient allocation of resources in the industrial chain and supply chain. E-commerce will become an important part of China's modern economic system and provide a powerful boost to economic globalization (Table 2.2).

(2) Major development tasks of e-commerce during the 14th Five-Year Plan period (Table 2.3).

2.1.3 E-Commerce-Related Policies

2.1.3.1 Industry Policies

1999 was the first year of e-commerce in China, and in the next 20 years, China's e-commerce experienced three development periods: the incubation period (1999–2005), the innovation period (2005–2015), and the leading period (2015–2019). The main feature of the incubation period is the survival of the fittest, which has not yet formed a fixed development model and various innovations have sprung up; the main feature of the innovation period is the winner is king, which gradually forms the e-commerce ecosystem by relying on the dividend released by the Internet population; the main feature of the leading period is the later comes first, which is dominated by content e-commerce and social e-commerce and continuously penetrates into agriculture and industry. The international influence of Chinese e-commerce has gradually increased since then. The current development of e-commerce in China continues the momentum of the third phase, with social e-commerce, B2B e-commerce, cross-border e-commerce, rural e-commerce, and silk road e-commerce developing rapidly and taking the lead in the world.

As a characteristic of China's socialist market economy, at different periods of economic development, the Chinese government has promulgated overall national five-year plans to set the overall goals and directions for the national economic development vision, and based on the five-year plans, each industry sector has formulated corresponding five-year plans with the current situation and characteristics of the industry. In 2007, the e-commerce industry introduced its first five-year plan, and each five-year plan for e-commerce is both a profound summary of the previous five

² Ministry of Commerce, Central Cyberspace Administration, Development and Reform Commission. 14th Five-Year Plan for E-commerce Development [R]. 2021-10-9.

Table 2.2 Main indicators for e-commerce development in the 14th Five-Year Plan

Category	Name of indicator	2020	2025	Remarks
Total size	E-commerce transaction volume (trillion yuan)	37. 2	46	Anticipatory
	National online retail sales (trillion yuan)	11. 8	17	Anticipatory
	Number of related employees (million)	6015	7000	Anticipatory
Subfield	Industrial e-commerce penetration rate (%)	63. 0	73	Anticipatory
	Rural e-commerce transaction volume (trillion yuan)	1. 79	2. 8	Anticipatory
	Cross-border e-commerce transaction volume (trillion yuan)	1. 69	2. 5	Anticipatory

Table 2.3 “Fourteenth Five-Year Plan” during the main development tasks of e-commerce

<p>1. Deepen innovation-driven, shaping high-quality e-commerce industry</p>	<p>Clearly put forward the development direction of e-commerce for technology application innovation, model innovation, collaborative innovation, green and low-carbon development in four areas, and clear “14th Five-Year” period, the main direction of China’s e-commerce innovation and development. Further guide e-commerce enterprises to change from relying on traffic growth to a development model that relies on innovation for growth and better serves important national strategies such as innovation-driven development, regional synergistic development, and carbon peak and carbon neutrality</p>
<p>2. Leading consumption upgrade and cultivating high-quality digital life</p>	<p>As an important force leading the growth and upgrading of consumption, e-commerce makes a greater contribution in promoting the construction of a complete domestic demand system in China and improving the dynamic balance of supply and demand in the industry. The Plan specifies that by creating new scenes of digital life consumption, enriching the new supply of online life services, and meeting the new demand for offline life services, multiple initiatives will be taken to promote the full integration of digital technology into social interaction and daily life, combine the expansion of consumption with the improvement of people’s quality of life, and construct a new picture of a better digital life</p>
<p>3. Promote the integration of business and industry to help the digital transformation of industry</p>	<p>The Plan clearly implements the strategy of manufacturing power, takes e-commerce as a link to promote the transformation and upgrading of the manufacturing industry base, the intelligence, and modernization of the industry chain; promotes the high-quality development of the manufacturing industry; and promotes the deep integration of advanced manufacturing industry and modern service industry. Take e-commerce as an important traction of industrial digitalization, actively cultivate new modes and new business models of industrial Internet, and help the manufacturing industry form a stronger innovation, higher value-added, safer, and more reliable industrial chain and supply chain</p>

(continued)

Table 2.3 (continued)

<p>4. Serve rural revitalization and drive the quality and expansion of the sinking market</p>	<p>In the report of the 19th Party Congress, the implementation of a rural revitalization strategy is proposed. E-commerce, as an important channel of urban-rural interaction, makes industrial products go to the countryside and agricultural products go up and is an important tool to enrich the supply of rural goods and promote farmers' income. The development of high-level rural e-commerce is conducive to the formation of a new industrial-agricultural-urban-rural relationship of mutual promotion between industry and agriculture, complementary urban and rural areas, coordinated development and common prosperity, which is of great significance to accelerate the modernization of agriculture and rural areas and implement the rural revitalization strategy</p>
<p>5. Advocate openness and win-win situation, open up a new situation of international cooperation</p>	<p>E-commerce has broken through the limitations of space on business activities, making global markets and global industrial chains and supply chains connected in real time, making a significant contribution to the promotion of economic globalization and global market collaboration. The Plan clearly proposes to develop cross-border e-commerce, promote international cooperation in e-commerce in the digital field, and promote the construction of international rules in the digital field, which specifies a specific path for e-commerce to help achieve a high level of opening up to the outside world. By encouraging e-commerce enterprises to implement global operations, actively developing "Belt and Road e-commerce", and playing a central role in the formulation of digital international rules, we promote the global economy from inter-industry cooperation to the direction of deep collaboration in the industrial chain and help promote the global governance system to develop in a more just and reasonable direction</p>

(continued)

Table 2.3 (continued)

<p>6. Promote efficiency changes and optimize the allocation of factor resources</p>	<p>The Plan proposes to promote a high level of development and utilization of data elements and clarify the importance of data resources for e-commerce. Developing data element market, activating data element potential, and establishing sound data element market rules provide an important guarantee for e-commerce to apply data elements in a compliant and efficient manner according to the law. In addition, the Plan complements the gradient construction of the e-commerce talent market, optimization of carrier resources, and multi-dimensional strengthening of financial services</p>
<p>7. Integrate the development of security and deepen e-commerce governance</p>	<p>In the past two decades, the field of e-commerce is one of the most rapidly developing and technologically iterative economic fields in China. The rapid development of e-commerce has put forward higher requirements for government governance and market supervision. The Plan emphasizes the improvement of the regulatory and standard system of e-commerce, the all-round improvement of e-commerce regulatory capacity and level, and the construction of a multi-governance pattern of e-commerce regulation and governance. The Plan is a comprehensive arrangement to build a scientific and efficient e-commerce governance system and form a strong governance capacity</p>

years and a target and direction for the next five years. At each stage of development, the development of e-commerce in China is guided by the five-year plan, and a series of supporting policies are introduced to support, encourage, and guide it, taking into account the specific reality at each point of time. With the five-year plan as the main line, the study of China's e-commerce development can clearly clarify the development of e-commerce, as well as the industry policy direction.

(1) “11th Five-Year Plan” period

In June 2007, the National Development and Reform Commission and the Information Technology Office of the State Council jointly issued China's first “*11th Five-Year Plan*” for the development of e-commerce. The Plan proposed six major tasks and six key projects (Tables 2.4 and 2.5).

(2) “12th Five-Year Plan” Period

In March 2012, the Ministry of Industry and Information Technology formulated and released the “12th Five-Year Plan for E-Commerce Development”, which is a guiding document to further promote the development of e-commerce in China's “12th Five-Year Plan” period, putting forward the “12th Five-Year”. This is a guiding document to further promote the development of e-commerce in China's 12th Five-Year Plan period. At the same time, in order to ensure that the objectives of the “12th Five-Year Plan” period are achieved, nine key tasks and nine corresponding columns are proposed in the document (Tables 2.6 and 2.7).

During the “12th Five-Year Plan” period, China has realized the application and promotion of mobile e-commerce in various fields, accelerated the pilot application of e-commerce in various industries, and achieved independent research and development of key intelligent core technologies. The application of e-commerce in China has given birth to a variety of different industries and fields, provided new ideas for poverty eradication, opened up new patterns of domestic and international cooperation and competition, and promoted economic growth in multiple senses.

(3) “13th Five-Year Plan” period

In December 2016, the Ministry of Commerce, the Central Internet Information Office, and the Development and Reform Commission issued the “13th Five-Year Plan” for the development of e-commerce and proposed development goals and five major tasks and 17 special actions in four areas of work.

During the 13th Five-Year Plan period, China's e-commerce has driven the deepening integration and co-development of the real and digital economies in all dimensions, accelerating the resolution of major social events due to its large scale, rapid growth rate, and wide scope. Digital life and work patterns have led to the explosive growth of online service e-commerce and the rapid development of all modes of e-commerce.³

³ Department of E-Commerce and Informatization, Ministry of Commerce China E-Commerce Report (2020) [R] 2021-09-15.

Table 2.4 “11th Five-Year Plan” general objectives, six major tasks, and six key projects

<p>The overall goal of China’s e-commerce development during the “11th Five-Year Plan” period</p>	<p>By 2010, the development of e-commerce environment, support systems, technical services, and the promotion and application of the pattern of coordinated development has basically taken shape, e-commerce services have become an important new industry, the national economy and social development in various areas of e-commerce applications to significantly improve the level and achieve significant results</p>
<p>Six major tasks</p>	<p>First, popularize and deepen the application of electronic commerce and improve the efficiency and quality of national economic operations Second, vigorously develop the e-commerce service industry, the formation of a new growth point for the development of the national economy Third, efforts to improve the support environment and promote the coordinated development of e-commerce Fourth, to encourage technological innovation in e-commerce and to improve the ability to develop independently Five is to strengthen market supervision and regulate the order of e-commerce Sixth is to increase the publicity and education efforts to promote the popularization of e-commerce applications The first two of these tasks are the focus of development during the “11th Five-Year Plan”, which is to practice the new road of industrialization and the implementation of the scientific concept of development of key initiatives, and the last four tasks are the “11th Five-Year Plan” period of basic support, which is the formation of a social environment conducive to the development of e-commerce infrastructure</p>

(continued)

Table 2.4 (continued)

Six key projects

First, a pilot project on e-commerce for government procurement
 Second, public e-commerce services project
 Third, the international trade e-commerce project
 Four is the mobile e-commerce pilot project
 Five is the logistics public information services project
 Six is the e-commerce support system construction project
 The specific deployment of the six projects reflects the development of e-commerce in the "11th Five-Year Plan" to play a demonstration role in the application of e-commerce government: to improve the e-commerce support environment to improve electronic authentication, online payment, and credit services: to popularize and deepen the application of e-commerce, with large backbone enterprises as the leader, small and medium-sized enterprises to actively use Third-party e-commerce service platform, the full implementation of various production and operation activities of business outsourcing, improve the management level and economic efficiency of enterprises, and further enhance the permeability of e-commerce applications

Table 2.5 E-commerce development during the “11th Five-Year Plan” period

<p>E-commerce development during the “11th Five-Year Plan”</p>	<p>During the “11th Five-Year Plan” period, the development of e-commerce to informatization as the base to drive the development of industrialization, industrialization to promote informatization as the main line, to build e-commerce support system as the core, to promote the organic combination of mode, management, and technological innovation as the focus, to vigorously develop third-party e-commerce services as the entry point, closely around the transformation of the central task of transforming the mode of economic growth, optimizing industrial structure, improving the efficiency and quality of national economic operation, coordinating the overall development, based on independent innovation, breaking through bottleneck constraints, strengthening policy guidance, highlighting construction priorities, in accordance with the combination of government-promoted and enterprise-led, creating an environment and promoting the application, combining the network economy and the real economy, combining key promotion and coordinated development, accelerating development and strengthening the development idea of combining management has promoted the full integration of e-commerce into all aspects of economic and social development, forming a new growth point for the national economy, promoting the optimization and adjustment of industrial structure, driving employment growth, and walking out of a road of e-commerce development with Chinese characteristics</p>
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Table 2.6 The general objectives of the 12th Five-Year Plan, the nine key tasks, and the corresponding nine columns

<p>The general objectives of the 12th Five-Year Plan</p>	<p>By 2015, e-commerce to further popularize and deepen the contribution to the national economy and social development significantly increased. The proportion of e-commerce in the modern service industry rose significantly. Electronic commerce system is basically sound, the initial formation of a safe and reliable, standardized, and orderly network business environment. Specific goals include e-commerce transactions exceeded 18 trillion yuan, of which the scale of e-commerce transactions between enterprises exceeded 15 trillion yuan, and network retail transactions exceeded 3 trillion yuan</p>
<p>The nine key tasks</p>	<p>First, to improve the level of e-commerce in large enterprises Second, to promote the popularization of electronic commerce in small and medium-sized enterprises Third, to promote the development of e-commerce in key industries Fourth, to promote the development of e-tailing scale Five is to improve the level of e-commerce government procurement Sixth is to promote the collaborative development of cross-border e-commerce Seven is to continue to promote the development of mobile e-commerce Eight is to promote the coordinated development of e-commerce support system Nine is to improve the security and technical support capabilities of e-commerce In the “Planning” also put forward in the form of columns for each task the key development direction</p>

Table 2.7 “13th Five-Year Plan” general objectives, five major tasks, and four areas of work of the 17 special actions

<p>“13th Five-Year Plan” general objectives</p>	<p>E-commerce is fully integrated into all areas of the national economy, developing and growing an e-commerce industry with a world influence, and promoting the formation of a large international e-commerce market with global collaboration. E-commerce economy enters the stage of scale development and becomes a key driving force for economic growth and the conversion of old and new dynamics. E-commerce fully covers all areas of social development, driving the innovative development of education, medical care, culture, tourism, and other social undertakings; e-commerce has become an important platform to promote employment, improve people’s livelihood, and benefit urban and rural areas. And put forward in 2020, e-commerce transactions exceeded 40 trillion yuan, online retail sales reached about 10 trillion yuan, and e-commerce-related practitioners more than 50 million people with specific goals</p>
<p>Five major tasks</p>	<p>First, to accelerate the quality and upgrading of e-commerce Second, to promote the deep integration of electronic commerce and traditional industries Third, to develop the e-commerce element market Fourth, improve the e-commerce livelihood service system Five is to optimize the e-commerce governance environment The five major tasks fully embody the development concept of “innovation, coordination, green, open, and sharing”, which is the framework system of e-commerce development during the 13th Five-Year Plan</p>
<p>Special actions</p>	<p>A total of 17 actions are deployed around four key plans, including e-commerce information infrastructure construction, new business models and new market cultivation, e-commerce factor market development, and e-commerce new order construction. 17 actions are reflected in the specific deployment of government work during the 13th Five-Year Plan period. The concept of “special action” is proposed for the first time because e-commerce has become a comprehensive economic work in many fields related to national economic and social development and involving many government departments. In order to meet the systematic and coordinated requirements of e-commerce work in the new era, each special action needs to be implemented jointly by multiple departments according to the division of labor</p>

(4) “14th Five-Year Plan” period

In October 2021, the Development and Reform Commission of the Central Internet Information Office of the Ministry of Commerce issued the “14th Five-Year Plan” for the development of e-commerce. The report provides an in-depth interpretation of the development of China’s e-commerce industry and future development trends and analyzes the opportunities and challenges facing the industry. Based on this, the goal of e-commerce development in this period and the seven major tasks that should be achieved to complete the goal were proposed (Table 2.8).

During the 14th Five-Year Plan period, e-commerce will continue to penetrate and integrate with the characteristics of various industries and further develop with the characteristics of multiple modes and cross-depth between industries, becoming a representative of the emerging economic model and promoting China’s economic development. Based on the positive impact of e-commerce on the national economy, the country is also strengthening its policies to help and support the development of e-commerce.

The development of e-commerce in the 14th Five-Year Plan period will be guided by Xi Jinping’s thought of socialism with Chinese characteristics in the new era, based on the new development stage, implementing the new development concept and serving to build a new development pattern, focusing on the three positioning of e-commerce connecting online and offline, bridging supply and demand, and docking domestic and foreign markets, and giving e-commerce a new mission of promoting “high-quality development of digital economy” and helping “achieve common prosperity”.

2.1.3.2 Tax Policy

E-commerce is an innovative transaction mode with the development of technology and network. From the perspective of the transaction, it is substantially the same as traditional commerce, so under the traditional taxation system, e-commerce should rightly belong to the scope of taxation. However, due to the characteristics of virtuality, invisibility, and intangibility, the traditional taxation system cannot be fully adapted to this emerging transaction mode. At the same time, because of the different preferential policies given to e-commerce enterprises by various local governments through fiscal policies, there is no uniform standard in the actual collection and management, which eventually manifests as different tax burdens for online and offline, giving rise to misunderstanding.

With the expansion of the e-commerce transaction scale, the problem of e-commerce tax leakage and tax fairness principle has become more and more important. In November 2016, *the General Office of the State Council on Promoting the*

Table 2.8 “14th Five-Year Plan” main objectives and seven major tasks

<p>Main Objectives</p>	<p>By 2025, China's high-quality development of e-commerce has achieved significant results. The new business model of e-commerce flourishes, the core competitiveness of enterprises is significantly enhanced, e-tailing continues to lead consumption growth, and a high-quality digital lifestyle is basically formed. E-commerce and primary, secondary, and tertiary industries accelerate the integration of a comprehensive promotion of the digital transformation of the industrial chain supply chain and become an important force to help the transformation and upgrading of traditional industries and rural revitalization. E-commerce depth link domestic and international markets, the level of internationalization of enterprises has been significantly improved, the ability to coordinate global resources has been further enhanced, and the “silk road e-commerce” has driven the international cooperation in e-commerce to continue to go deeper and more real. E-commerce rule of law, refinement, and intelligent governance capacity is significantly enhanced. E-commerce has become an important engine for the comprehensive digital transformation of the economy and society, an important channel for employment and entrepreneurship, an important source of income growth for residents, and an important role in better meeting people's needs for a better life</p>
<p>Seven major tasks</p>	<p>First, deepening the innovation drive and shaping a high-quality e-commerce industry Second, to lead consumption upgrading and cultivate high-quality digital life Third, to promote the integration of business and industry and to help the digital transformation of industry Fourth, to serve the revitalization of the countryside, promote the quality of the sinking market, and expand capacity Five is to advocate openness and win-win, to open up a new situation of international cooperation Sixth is to promote efficiency changes and optimize the allocation of factor resources Seven is to coordinate the development of security and deepen e-commerce governance</p>

Innovation and Transformation of Physical Retailing explicitly proposed to “accelerate the construction of a supervisory system that is synergistic between the production and circulation fields and integrated between online and offline” and “create a tax environment for fair competition between online and offline enterprises”. In other words, any form of trade should equally bear the same tax burden and have a fair tax environment and market competition. In August 2018, *the E-commerce Law of the People’s Republic of China*, which was voted at the fifth meeting of the Standing Committee of the 13th National People’s Congress, plays an important role in regulating the taxation of e-commerce (Table 2.9).

2.1.3.3 Talent Policy

The development of e-commerce industry can’t be separated from the support of e-commerce talents. In the “14th Five-Year Plan” for the development of e-commerce, it is clearly proposed to “develop the e-commerce talent market in a gradient”, to improve the talent training system, strengthen the talent training mode, and provide a better employment environment for talents and thus strengthen the supply of diversified talents. Through a variety of ways to improve the attractiveness of the e-commerce industry and field in all aspects.⁴

- (1) Talent industry policy: Iterative optimization, release effectiveness, and guide high-quality e-commerce talent training.⁵

The high-quality development of e-commerce is built on the basis of the high-quality development of e-commerce talents. The top-level design further strengthens the development concept of high-end leading in the cultivation of high-quality talents in e-commerce and improves the classification of jobs in the field of e-commerce, occupational standards, and the evaluation standard system of e-commerce-related abilities. From policy formulation, responsibility in place, to the gradual improvement of the breeding and employment mechanism, to promote China’s e-commerce high-quality talent training work to achieve fruitful results. Policy optimization further strengthens departmental collaboration, forms policy synergy, explores the introduction of corresponding e-commerce talent support policies, creates an environment conducive to the development of talent, encourages diversified employment of talent, protects the employment rights of talent, and further precise policy, release the effectiveness of the e-commerce high-quality talent cultivation of the incentive policy to the integrated incentive policy, so as to maximize the utility of incentive policy. Demonstration-driven, focusing on how to pull up the level of talent within the e-commerce industry, enhances the industry’s leading enterprises to play a leading role, so as to attract more high-level high-end talent into the industry. At the same time,

⁴ Ministry of Commerce Central Internet Information Office Development and Reform Commission. Fourteenth Five-Year Plan for the Development of Electronic Commerce [R]. 2021-10-9.

⁵ “*The Fourteenth Five-Year Plan*” for E-Commerce Development Expert Group Gao Gongbu High-quality E-Commerce Talents Leading High-quality E-Commerce Development-China International E-Commerce Network (ec.com.cn).

Table 2.9 Tax-related regulations in the Electronic Commerce Law of the People's Republic of China

Terms	Content
Article 4	The state treats online and offline business activities equally and promotes the integrated development of online and offline. People's governments at all levels and relevant departments shall not take discriminatory policy measures and shall not abuse administrative power to exclude and restrict market competition
Article 10	E-commerce operators shall register as market entities in accordance with the law. However, individuals selling homegrown agricultural products, cottage industry products, individuals using their own skills to engage in the activities of the people's labor, and small-scale transactions without obtaining permission, as well as in accordance with the laws and administrative regulations do not need to be registered, except for
Article 11	E-commerce operators shall fulfill their tax obligations in accordance with the law and enjoy tax benefits in accordance with the law. In accordance with the provisions of the previous article does not need to apply for registration of market entities of e-commerce operators after the first tax obligations shall apply for tax registration in accordance with the laws and administrative regulations on tax collection and management and truthfully declare taxes
Article 28	E-commerce platform operators shall report to the market supervision and management departments in accordance with the provisions of the identity of operators in the platform, prompting operators who have not been registered as market entities to apply for registration in accordance with the law, and cooperate with the market supervision and management departments, for the characteristics of e-commerce, for operators who should be registered as market entities to facilitate registration E-commerce platform operators shall, in accordance with the laws and administrative regulations on tax collection and management, report to the tax authorities the identity information of the operators in the platform and information related to taxation and shall prompt the e-commerce operators who are not required to register as market entities in accordance with Article 10 of this Law to apply for tax registration in accordance with the provisions of paragraph 2 of Article 11 of this Law

through policy guidance, for returning migrant workers, college students, veterans, and other types of hometown personnel, to carry out hierarchical cultivation, training can lead to the development of rural e-commerce new electricians.

(2) Collaboration of regional parties: Two-line interaction to build a high-performance e-commerce talent market

E-commerce talent market is an important channel for the employment of e-commerce talents, and a diversified and efficient e-commerce professional talent market should be established through various flexible means. On regional collaboration, relying on the eastern provinces' e-business industry and talent advantages, facing the central and western regions and other relatively weak e-business industries, launching multi-regional collaboration such as east-west cooperation and north-south cooperation, increasing industrial assistance and talent support, increasing efforts to cultivate the e-business talent market in central and western regions, cities, counties, and rural areas, and optimizing the employment process within the e-business industry, such as business incubation parks and employment resource matching services. On the two-line interaction, we make full use of online e-commerce talent market resources, quickly dock with school-enterprise resources, and provide 24/7 e-commerce talent employment services. Offline, e-commerce associations, and societies at all levels and talent exchange markets around the world, familiar with the needs of e-commerce enterprises, should further play their great role in matching e-commerce talents. At the same time, universities, as an important platform for talent output, regularly hold multiple talent markets to collaboratively solve the problem of e-commerce talent output.

(3) Industry-academia-research multi-party collaboration: Six-in-one, build a multi-level e-commerce talent system

E-commerce high-quality talents need six-in-one, multi-resource synergy, encourage higher education institutions, research institutions, training institutions, and e-commerce enterprises, using order training, embedded training, online training, and other ways to cast the hierarchy of e-commerce talent system, and finally realize the linkage between talents.

At the level of colleges and universities, as the main force for training e-commerce talents, colleges and universities should further grasp the essence of the Plan and carry out targeted and forward-looking training. College faculty construction, professional construction, and specialized personnel training should keep pace with the times and resonate with industrial development, so as to play a prominent role in the development of e-commerce in the 14th Five-Year Plan period. At the enterprise level, e-commerce platform enterprises are encouraged to increase education and training efforts, play a close connection between platform enterprises and the market, the obvious advantage of the talent gathering effect, increase e-commerce knowledge and skills education and training, and actively develop e-commerce application courses to improve the coverage and effectiveness of training. Encourage e-commerce enterprises and universities to cooperate deeply, using order training, embedded training, and other flexible ways to meet the needs of enterprise talents.

With the empowerment of digital technology, promote the digitization and online e-commerce quality education resources of government, colleges and universities, training institutions, etc., increase the openness to the society, and encourage the realization of all-weather e-commerce education through various ways such as webcasting. At the same time, online public welfare classes are carried out for the central and western regions and rural areas to empower the development of e-commerce in the sinking market.

- (4) Innovation-driven, entrepreneurship-driven, to enhance the ability of high-quality e-commerce talent

Innovation and entrepreneurship play an important role in improving the comprehensive ability of e-business talents, and the innovation-driven strategy should be further strengthened to encourage pragmatic entrepreneurship and enhance the ability of high-quality e-business talents. On the one hand, it is necessary to further strengthen the leading role of innovation and entrepreneurship in the cultivation of e-commerce talents; on the other hand, it is necessary for all social parties to actively coordinate resources, effectively integrate theories, methods, technologies, and means of innovation and entrepreneurship in various fields and links of e-commerce, strengthen innovation-driven, emphasize entrepreneurship-driven, and integrate into Civic Education in order to effectively enhance the comprehensive ability of e-commerce talents.

Innovation and entrepreneurship competitions can catalyze the cultivation of e-commerce talents to a great extent. Therefore, we should strengthen the collaboration of innovation and entrepreneurship competitions such as China International College Students' "Internet+" Innovation and Entrepreneurship Competition, "Challenge Cup" National College Student Business Plan Competition, and China National College Student "Innovation, Originality, and Entrepreneurship" Challenge. From urban to rural areas, we should promote learning, action, and creation through competitions, mobilize the enthusiasm of all kinds of innovators and entrepreneurs, and enhance the demonstration and driving ability of e-commerce innovation and entrepreneurship.

2.1.4 E-Commerce Governance and Regulation

2.1.4.1 Collaborative E-Commerce Regulatory Initiatives in China

At the beginning of the twenty-first century, the rapid development of online information technology has given rise to large-scale e-commerce activities and new ways of market transactions in China. The emerging e-commerce market activities have posed new challenges to the old traditional market order, government regulatory approaches, and theories. The new government regulation needs to go beyond the original boundaries in order to prevent the failure of public values in the market and

to effectively safeguard market efficiency. The new concept of collaborative governance of market regulation is based on the fusion of the two theories of synergy and governance. It emphasizes pluralistic, equal, collaborative, and orderly subjects of governance. Generally speaking, the main body of the collaborative governance concept is a common management mechanism formed by the government, the public, the media, and other parties. Through these subjects, a multi-faceted supervision of e-commerce activities is carried out.

The E-Commerce Law, which has been implemented since 1 January 2019, proposes to establish a collaborative management system throughout society that is in line with the characteristics of e-commerce market transactions. It further promotes the formation of a multi-party governance system for the e-commerce market with the participation of relevant government departments, industry self-regulatory organizations, e-commerce operators, consumers, and other subjects. This is the concrete practice of collaborative regulation theory in e-commerce regulation. To ensure the successful implementation of this practice requires the joint efforts of multiple entities.

First of all, the core value of e-regulation is the consensus to be reached by all participating subjects, that is, the core value identity, and let these core values become the common goal and behavioral norms of all participating subjects.

Secondly, each participating body should adhere to the direction of pluralistic governance and collaborative goals and clarify the responsibilities and division of labor between them. At present, China's social governance emphasizes "leadership by the party committee, responsibility by the government, social coordination, and public participation", with the government being the first responsible party. The strengthening of the "intra-institutional" regulatory mechanism is also an important guarantee for the implementation of regulatory objectives. As e-commerce regulation involves many departments, such as the Ministry of Commerce, the Cyberspace Administration of China, the State Internet Information Office, the State Administration for Market Regulation, the People's Republic of China State Post Bureau, the Ministry of Agriculture and Rural Affairs, the General Administration of Customs, the Ministry of Public Security, the financial sector, and more than 20 other departments. A central coordinating authority needs to be established for each sector, and their respective regulatory rights and obligations should be clarified and implemented in strict accordance with the relevant regulatory laws and regulations. Strengthening the industry self-regulatory mechanism, industry organizations are a bridge between government departments and business organizations, allowing them to effectively play a guiding and supervisory role over enterprises which is another important safeguard for collaborative supervision. Strengthen the regulation of e-commerce platforms and the regulation of merchants by e-commerce platforms. On the one hand, it is important to prevent platforms from relying on traffic data and market dominance to the detriment of merchants and consumer rights. On the other hand, platform companies have the first-hand transaction data and merchant information of e-commerce. At the same time, these enterprises have advanced computer technology, so they have the advantage of regulating merchants and transactions, and it is more important to guide the platforms to play a positive regulatory role. Strengthen

citizen supervision. Although citizens cannot exercise the right to regulate in accordance with the law, they have the right to know, express, and participate and can report and supervise unlawful acts in e-commerce. Through policy guidance, we will promote the collaborative efforts of all social parties to achieve universal regulation.

Finally, it relies on information technology to achieve “intelligent network supervision”. The “smart network supervision” improves the limitations of traditional supervision which is fragmented, focused, static, and manual. It is based on new concepts and technologies to achieve collaborative supervision, comprehensive supervision, dynamic supervision, and intelligent supervision. Government market supervision departments and multiple parties join forces to build a collaborative regulatory mechanism with information sharing at its core and build an off-site collaborative information technology network platform to achieve online collaborative investigation, case handling, referral, and flow integration for processing.

2.1.4.2 Overview of E-Commerce Laws and Regulations

E-commerce law is a legal code that covers all commercial activities conducted by means of data messages. In addition to this, there are many other laws and regulations relating to e-commerce in China.

(1) E-commerce law

The *E-Commerce Law* is a comprehensive law in the field of e-commerce, covering all aspects of e-commerce, stipulating the conditions and mechanisms for e-commerce subjects to enter and exit from e-commerce, which has the content of subject law; regulating the legal relationship and transaction behavior between subjects in e-commerce, which has the content of conduct law; and also regulating the dispute resolution and supervision of e-commerce by the government and society. At the same time, it also has the content of promotion law to facilitate e-commerce transactions and promote the development of e-commerce.

(2) Laws in other sectors

In order to avoid conflicts with other existing laws, the *E-Commerce Law* only regulates special matters in the field of e-commerce. For e-commerce subjects, because they are engaged in e-commerce activities, they have behaviors involving civil, commercial, and other areas, which also need to be regulated by civil, intellectual property law, commercial law, economic law, criminal law, and other laws and regulations. Thus, the legal system regulating e-commerce includes *the E-Commerce Law of the People’s Republic of China*, *the Civil Code of the People’s Republic of China*, *the Law of the People’s Republic of China on the Protection of Consumers’ Rights and Interests*, *the Copyright Law of the People’s Republic of China*, *the Electronic Signature Law of the People’s Republic of China*, and other laws and regulations.

(3) Relationship between the E-Commerce Act and other sectoral laws

For the final implementation of *the E-Commerce Law*, the prerequisite is a good interface and coordination between it and the relevant laws and regulations. In accordance with the priority of law at the higher level over that at the lower level, if the provisions of *the E-Commerce Law* overlap with other laws of a different rank on a particular element, the higher level law is used. In accordance with the special law should be adopted before the common law and new law should be adopted before old law, if *the E-Commerce Law* and other relevant sectoral laws both provide for a particular element of e-commerce and the two sectoral laws are of the same rank, a determination will need to be made in accordance with the two principles mentioned above. According to the principle of the prevalence of regulations over non-regulations, if *the E-Commerce Law* does not regulate the content of a particular e-commerce involved, but other relevant laws do, then the content of the specific sectoral law that does regulate should be applied for adjustment.

2.1.4.3 Anti-Monopoly Policy

Chinese Anti-monopoly Law stipulates that monopolistic conduct includes monopolistic agreements among undertakings, abuse of dominant market positions by undertakings, and concentration of undertakings that lead or may lead to elimination or restriction of competition. In recent years, countries around the world have legislated in response to anti-monopoly issues in the digital economy. In general, the leading companies in the digital economy are larger, stronger, and bring more negative externalities to the market in the competition between companies. The Internet platform economy has entered a phase of rapid development in China, and as a result, many industries have given rise to large-volume Internet platform companies, including some e-commerce platforms, which are also among these digital giants.

In order to gain more market share and thus maximize profits, platform managers are innovating their business models while competition is becoming increasingly fierce. Phenomena such as “pick one of two”, “big data discriminatory pricing”, and “platform algorithm collusion” have gradually emerged in platform competition. The most typical of these is the “pick one of two” trading practice imposed by platforms on their internal operators. The term “pick one of two” is an objective expression of the fixed and exclusive trading relationship created by an Internet platform that requires the business managers within the platform not to choose the object of the transaction at their own will. The involvement of technology makes such restricted transactions even more complex, hidden, and difficult to prove. For operators who do not comply with the “pick one of two” rule, e-commerce platforms often take a variety of technical disciplinary measures, such as limiting the flow of e-commerce platforms, reducing the search weight in search engines, blocking shops on the platform, taking products

offline or closing the purchase portal, etc., so that internal operators can quickly cut off the flow through these means. Restricted trading practices are not conducive to the healthy development of China's e-commerce industry and have repeatedly caused controversy and great concern.

In August 2019, the General Office of the State Council issued *the Guidance Opinions of the General Office of the State Council on Promoting the Standardized and Healthy Development of the Platform Economy* clearly stating that the "pick one of two" behavior required by Internet e-commerce platforms should be severely cracked down on to ensure fair participation of market players in the competition. In December 2020, in accordance with *the Anti-monopoly Law*, China's State Administration of Market Supervision conducted an investigation against Alibaba Group and issued an administrative penalty decision against it in April 2021. The investigation revealed that Alibaba Group's failure to comply with the "pick one of two" requirement and its reliance on the company's market position to prohibit merchants on its platform from accessing other e-commerce platforms as a means of enhancing its market competitiveness was a serious breach of market law. In February 2021, the Anti-Monopoly Committee of the State Council formulated and issued the Anti-Monopoly Guideline of the Anti-Monopoly Committee of the State Council on the Anti-Monopoly in the Platform Economy. The guide further clarifies the basic principles of the state's anti-monopoly in the platform economy and aims to guide the high-quality and orderly development of the platform economy through sound regulatory rules.

On the legal front, *the Anti-Monopoly Law of the People's Republic of China* is a legal regulation enacted by the State in the prevention and suppression of monopolistic practices. The law aims to safeguard equal competition in the domestic market and the legitimate rights and interests of all consumers in society, ultimately achieving the goal of improving the efficiency of economic operations and promoting healthy socio-economic development. E-commerce platform operators are a key focus of *the E-commerce Law of the People's Republic of China*. Article 22 of the Decree clearly states that any platform operator cannot use its dominant position in the market to impede the normal market operations of other platform operators in the market through various means. *The Law of the People's Republic of China against Unfair Competition* has been relied upon for a number of purposes due to its content features, which do not require a finding of market dominance in relation to any unfair competition. Article 12 of the Act states that the impact of technological means on the market environment cannot be underestimated and needs to be considered in conjunction with other multiple factors due to the difficulty of identification.

2.1.4.4 Intellectual Property Policy

The existence of the Internet has made it easier and faster to circulate intellectual property rights, but due to its virtual nature, there are numerous cases of Internet infringement. In terms of copyright infringement, it is easy for Internet users to obtain

information about the rights holder's works, exploit it in various ways, and disseminate it at speed, infringing on the rights of the rights holder, including the right to disseminate information over the Internet. As patents should be granted on a balance of novelty, utility, and inventiveness, the technical requirements are higher, making infringement more difficult to identify.⁶ In particular, the element of inventiveness, for which there is no fixed measure, has led to a large number of infringing goods being bought and sold in large quantities within the e-commerce industry. Infringement, particularly in relation to patents, is mostly difficult to justify externally. At the same time, trademark infringement in the industry is very serious. Well-known trademarks have a significant effect on the sales of goods, while the territorial nature of trademark rights makes the same trademark independent of different countries. With the addition of virtual trading on the Internet, trademark counterfeiting and other infringements are rife in e-commerce trade.

The E-Commerce Law contains explicit references to the legal regime for the protection of intellectual property rights on China's e-commerce platforms. The Act sets out the obligations and duties of platform operators and operators within the platform, the ways for IPR rights holders to defend their rights in the event of infringement, what legal responsibilities infringers should bear after the infringement, etc. Articles 42 and 45 clarify the joint and several liabilities that platform operators should assume after passively dealing with IPR infringements. This provision allows platforms to no longer dare to sit back and watch and to take the initiative to assume the responsibility and the role that platforms should play and to play a central role among all parties involved in the protection of IPR in e-commerce, giving full play to their technical and governance advantages in online transactions. In addition to *the E-Commerce Law*, a number of laws, including *the Tort Liability Law of the People's Republic of China* and *the Regulation on Protection of the Right to Network Dissemination of Information*, also provide for the protection of intellectual property rights.

Strengthening the protection of property rights in e-commerce requires the joint participation of the government, platforms, society, enterprises, and individuals to improve the overall level of IPR protection in China in terms of the rule of law, platform governance, technology governance, and the cultivation of independent industries.

In terms of the rule of law, China has continued to improve its legal and regulatory system and to build up the protection of intellectual property rights in e-commerce. *The Civil Code of the People's Republic of China* was voted on and passed, establishing a benchmark for China to strengthen intellectual property protection; the fourth amendment to *the Patent Law* has been completed; and *the new Trademark Law* and supporting policies have been introduced. The construction and improvement of the legal system have strengthened the foundation for the protection of intellectual property rights in e-commerce.

In terms of platform governance, the platform rule system needs to be improved. This includes audit system, credit evaluation system, penalty system for violations,

⁶ Article 22 of *the Patent Law of the People's Republic of China*.

data monitoring system, etc. Multiple systems are combined to achieve effective regulation and management of the platform and to guarantee the orderly and efficient operation of the platform economy.

In terms of technology governance, as we enter the digital economy, China is gradually moving toward the center of the world stage in terms of artificial intelligence, cloud computing, and other Internet technologies. At this time, it is even more important to make full use of technology to create an intelligent IPR protection system, improve the level of prevention and control, and use high technology to build an IPR protection system.

With regard to the cultivation of autonomous industries, China's high-tech enterprises need to invest more in the development of their own core technologies and strive for their own independent intellectual property rights. At the same time, they need to combine digital information technology for industrial optimization and upgrading, so as to achieve a sustainable upgrade of China's multi-disciplinary and multi-industry industries and improve Made in China in all aspects.

2.2 Markets

In the process of structural change, the “Promising Government” needs to continuously improve and upgrade the infrastructure to solve the external problems that arise. The “Efficient Markets” is also shaping the comparative and competitive advantage of enterprises, through the decisive role of the market in the allocation of resources and the formation of a price system that reflects the scarcity of factors. Based on their comparative advantage, enterprises choose to invest in industries and technologies that are in line with their development. In the process of developing a competitive advantage, enterprises need to give full play to their position as market players and develop e-commerce under the combined effect of a series of market theories. This section focuses on a series of market theories in the context of “Efficient Markets” from three perspectives: demand-side theory, supply-side theory, and platform theory.

2.2.1 *Demand-Side Theory*

2.2.1.1 The Long Tail

Chris Anderson introduced the concept of the “long tail” in 2004,⁷ using the term to analyze the business models of several websites. The results showed that with a certain level of liquidity and warehousing, the total market share of non-hot items (products with low sales) can be comparable to that of a few hot items (products with high sales per item). The theory is that when there are enough channels of storage and

⁷ By Chris Anderson, translated by Jiangtao Qiao. Long Tail Theory [M]. CITIC Press, 2006.

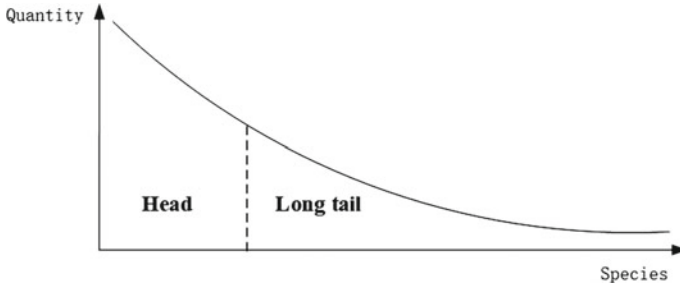


Fig. 2.2 The Long Tail

circulation, even a product with a small market can generate just as much revenue, and that when a combination of small markets can create a market energy that rivals that of large markets. Another great number $Q =$ An extremely large number (products in the long tail P_i)* A relatively small number (sales of each long-tail product Q_i), i.e. total sales $Q = P_1 Q_1 + P_2 Q_2 + P_3 Q_3 + \dots = \sum_{i=1}^n P_i Q_i$. This provides a long-overdue business opportunity in the Internet age.

With the advancement of computer network technology, the Internet has truly transcended time and space, making people’s needs more and more diverse, and the Long Tail was born. However, in the market, people tend to notice the head part of the long-tail curve and ignore the gentle tail part behind it (As Fig. 2.2 shows). This means that the market demand in the tail section is not being met and there is still a basis for capturing the benefits. In The Long Tail, the market in the head segment is generally characterized by higher prices, better quality, and easy access to groups with higher levels of consumption. Conversely, markets in the tail segment are characterized by lower prices, less quality, but more quality, etc.

In the context of China’s rapid economic development, consumer upgrading has become the core keyword of the current consumer market, especially in the vast rural market, where inexpensive goods also have a very broad market demand (MD). On the one hand, digital e-commerce (EC) through community marketing (SS) and other ways can quickly enhance the breadth of users (UN), to solve the traditional e-commerce market of the long tail of the problem, can let the majority of user groups to obtain e-commerce dividends, can maximize the activation of the rural economy, and improve the ecology of rural e-commerce, that is $UN = f(EC, SS)$. On the other hand, in order to meet the consumption experience (CE) of the long-tail user group, digital e-commerce (EC) offers more diversified and specialized services (PS), namely $CE = f(EC, PS)$, the total market demand is obtained as $MD = f(UN, CE)$. The development of digital e-commerce in rural areas in recent years has greatly compensated for the lack of e-commerce in China in this area. In order to solve the Long-Tail problem, companies need to choose personalized products as the “Long Tail” and dig deeper into the individual and diverse needs of users in order to gain market favor. The “Long Tail” of products for e-commerce companies is undoubtedly digital products with diminishing marginal costs and significant marginal revenue.

For example, well-known Internet company B has targeted the vacancy in the tail market by focusing on the rural market, opening up the competitive landscape of China's e-commerce market. At the same time, the cost of distributing goods in China is gradually decreasing due to the application of technologies such as blockchain in this area, satisfying the needs of long-tail users and providing momentum for the development of the tail market.

2.2.1.2 Theory of Consumer Behavior

Consumer behavior forms an important part of the e-commerce landscape. The definition of consumer behavior is that the individual or group moves from choice to purchase, from purchase to use, and even includes recommending products, evaluating them, and sharing experiences of using them.

There are many factors that influence consumer behavior, including education, salary, age, etc. Research on factors influencing consumer behavior can be broadly divided into two categories, one based on classical models and theories such as the stimulus-organism-response model (S-O-R), theory of reasoned action (TRA), and technology acceptance model (TAM). The second is to adapt classical behavioral models or to construct them themselves. In 1925, Strong introduced the AIDA model to the evaluation of advertising effectiveness. The AIDA model provides a detailed explanation of how consumers complete the complete purchase process, which is divided into four stages: awareness, interest, expectation, and action, depending on the level of consumer response in the process. In 1898, Lewis proposed the traditional model of consumer behavior theory AIDMA, the five stages from attention, interest, desire, memory to action. This was followed by the explosion of the Internet and mobile applications, which led to a paradigm shift in consumer behavior and the emergence of the AISAS model of consumer behavior theory. The AISAS model is an improvement on the original AIDMA model, which was discussed in the context of the Internet and is a new marketing model for the study of modern Internet consumer behavior. Its basic idea is the process of "Attention → Interest → Search → Action → Share (Attention $S^{(1)}$) → Interest $S^{(2)}$) → Search $S^{(3)}$) → Action $S^{(4)}$) → Share $S^{(5)}$)" (Fig. 2.3).

In the AISAS model, the first stage is concerned with $S^{(1)}$, which refers to the delivery of product information and promotions to consumers through various media by the platform or merchant, and the generation of transaction demand (d) by consumers for a change. In this process, e-commerce companies promote their goods



Fig. 2.3 The five stages of the AISAS model of consumer behavior theory

to consumers through promotional exhibitions, increased media exposure channels, increased advertising intensity and product diversity, and consumers obtain the product information they need to meet their needs in various ways $I^{S(1)}$, i.e. $I^{S(1)} = S^{(1)}(d)$. The second stage is interest $S^{(2)}$, which is concomitant with attention and refers to the ability of the information about the goods to attract the active attention of the consumer, to evoke a latent need within the consumer, and to satisfy it, thus generating the willingness and desire to consume $D^{S(2)}$, i.e. $D^{S(2)} = S^{(2)}(I^{S(1)})$. The third stage is search $S^{(3)}$, which refers to consumers obtaining more refined information about the product from a variety of sources, further increasing their motivation to buy and forming a purchase intention $D^{S(3)}$. At this stage, the satisfaction of consumers' psychological expectations is not only related to the intrinsic characteristics of the goods, i.e. the matching of their value with consumers' expectations $M_1^{S(3)}$, but also to the external factors of the goods $M_2^{S(3)}$, such as the convenience of facilities, payment methods, the distance required for consumption, and the consumer protection system. $D^{S(3)} = S^{(3)}(D^{S(2)}) = S^{(3)}(M_1^{S(3)}, M_2^{S(3)})$; The fourth stage is action $S^{(4)}$, i.e. consumer action $A^{S(4)}$ that arises when the consumer is informed about the product, has the intention or impulse to buy, and the product and service meet the demand, and is an action for a specific product, including payment for the product, logistics and delivery, and after-sales service. Consumer actions are influenced by purchase intentions $D^{S(3)}$, but also by consumption habits $C^{S(4)}$, such as whether consumers choose to spend in physical shops or on the Internet, or whether they combine online and offline. Payments are made in cash or using a third-party payment platform, or by bank transfer. $A^{S(4)} = S^{(4)}(D^{S(3)}, C^{S(4)})$; The fifth stage is sharing $S^{(5)}$, which refers to the self-generation of subjective and objective content information $E^{S(5)}$ by consumers with the help of reviews on social areas of e-commerce platforms or third-party social media to attract the attention of future new users, i.e. $E^{S(5)} = S^{(5)}(A^{S(4)})$. With the growing diversity of new media, the relationship between users within the same community has been brought closer. In addition, consumers can not only rate their purchases, but also share and spread their reviews, thus influencing other potential consumers. Noting this post-purchase sharing as $E_s^{S(5)}$ and the range of sharing as $S(E_s^{S(5)})$ then we

$$\text{have } S(E_s^{S(5)}) = [S_{ij}(E_s^{S(5)})]_{\infty} = \begin{bmatrix} S_{11}(E_s^{S(5)}) & S_{12}(E_s^{S(5)}) & \cdots \\ S_{21}(E_s^{S(5)}) & S_{22}(E_s^{S(5)}) & \cdots \\ \vdots & \vdots & \ddots \end{bmatrix}. \text{ And } S_{ij}(E_s^{S(5)})$$

refers to the impact of the i th consumer's evaluation sharing on the j th potential consumer.

In summary, the overall process of consumer behavior can be described as follows:

$$E^{S(5)} = S^{(5)}(S^{(4)}(S^{(3)}(S^{(2)}(d)))) \quad (2.1)$$

To effectively consolidate their core position in the market, e-commerce companies should listen carefully to the voices of consumers and users and recognize that improvements in products and services are not unfounded. In addition to collecting users' opinions and suggestions, we also profile them based on their basic information and record them in our records. This enables companies to plan their products and improve their after-sales service, ultimately increasing consumer stickiness.

2.2.1.3 Maslow's Hierarchy of Needs

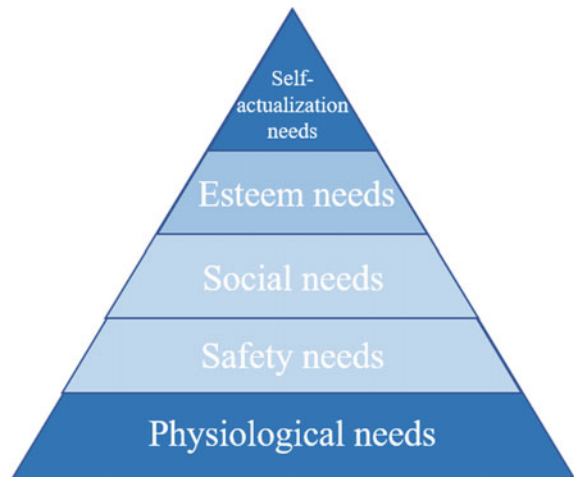
In 1943, Maslow divided the hierarchy of needs from low to high into five types: physiological needs H_1^N , security needs H_2^N , social needs H_3^N , respect needs H_4^N , and self-actualization needs H_5^N . When lower level needs are satisfied, people's higher level needs will crave to be fulfilled. The first three needs are the basic stage needs, which are indispensable for human survival, while respect and self-actualization belong to the higher level needs (Fig. 2.4).

In the e-commerce sector, consumers at different levels of need will react differently and influence their decisions during the consumption process.

(1) Physiological needs H_1^N —Daily functions of e-commerce products

In the real world, human beings have the most basic physiological needs, which are the type of needs that people have to satisfy in order to survive. For consumers in the e-commerce sector, the most basic need is to realize the functions of e-commerce products and to meet the basic daily use needs of users, including clothing, food, shelter, and transportation.

Fig. 2.4 Hierarchy of needs theory



(2) Safety needs H_2^N —Product quality assurance for e-commerce

Security needs include the need for personal safety, physical health, and stability in life. It is the second need that needs to be satisfied after the physiological needs have been met. For consumers in the e-commerce sector, this level of demand revolves around product quality, such as product traceability, which is increasingly important to consumers. Product traceability includes the raw material, processing material, environment of origin, and producer of the product.

(3) Social needs H_3^N —Exchange e-commerce products

Social needs include the need for belonging and love, which is the turning point in the hierarchy of needs and which drives people to interact with others. When this demand is extended to the e-commerce sector, consumers' social needs are reflected in communicating about products. Specifically, it is in the process of communicating with others to gain further insight into the e-commerce product and lead to the consumer's next decision. For example, the comment sections and live streaming rooms for products on e-commerce platforms and instant dialogues for merchants all reflect the social needs of consumers for e-commerce products.

(4) Esteem needs H_4^N —e-commerce product personality

Esteem needs include recognition, approval, and respect for oneself and for others. For consumers in the e-commerce sector, esteem needs are reflected in their need for the personalization of e-commerce products. This includes personalization of e-commerce product design, personalization of e-commerce products, friendly pop-up boxes on e-commerce platforms, the possibility of receiving approval from others after reviewing products, and selected reviews on e-commerce platforms. All of the above can lead to a sense of satisfaction for consumers. When this satisfaction is transformed into a sense of achievement in use under certain circumstances.

(5) Self-actualization needs H_5^N —sublimated consumer behavior

Once the need for respect has been satisfied, the highest level of need emerges, namely the need for self-actualization. The need for self-fulfillment is a psychological satisfaction and a sense of value. For example, the “anti-poverty projects” and “the Belt and Road” e-commerce promotion in the live broadcast. Consumers feel that they are helping others while buying products. This psychological formation also adds value to the act of buying a product.

Only after the lower level needs have been satisfied does the consumer show a desire for the higher level needs, i.e. when the consumer need $\supset H_k^N$, then there is that $D = H_1^N \cup \dots \cup H_k^N$, $1 \leq k \leq 5$. When a consumer is unable to satisfy a higher level need, he or she relies on the pseudo-pleasure that comes from the next highest level need. That is, the consumer must try to satisfy the highest need within his or her ability, when the utility U^N from that level of need is greatest, and there is that $U_1^N < U_2^N < U_3^N < U_4^N < U_5^N$.

2.2.2 Supply-Side Theory

2.2.2.1 Theory of Price Elasticity of Demand

In the face of increasing competition in the market, pricing strategies will greatly affect the sales of a company's products. In marketing, we often come across a phenomenon. Businesses sometimes adopt promotional strategies, that is, they attract the attention of consumers by lowering the price of their products in order to increase sales. However, some products do not have significant appeal when prices are reduced and overall sales revenue is reduced. The reason for these two very different results lies in the different price elasticity of demand for the products. Therefore, with the rapid development of the market economy, enterprises correctly apply the theory of price elasticity of demand in the right areas to explore and master the laws of market development in this way can they ultimately win the market.

The elasticity of demand generally refers to the price elasticity of demand E_d . It refers to the extent to which a change in price $\frac{\Delta P}{P}$ causes a change in the quantity demanded $\frac{\Delta Q}{Q}$. The formula for this is

$$E_d = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q} \quad (2.2)$$

The price elasticity of demand for a product in e-commerce refers to the fluctuation of the demand for a product in an e-commerce market in relation to changes in the price of the product. It is important to note that e-commerce markets are different from natural markets in the traditional sense. In addition to the general market, e-commerce markets also include e-commerce platforms. The price of products on the platform is influenced by both supply and demand as well as the behavior of the platform. Therefore, the price of a product on an e-commerce platform also contains multiple meanings. The price in a broad sense is the price after including activities such as platform bonuses, discounts, and full discounts. A weighted average based on the price elasticity of demand for a product captures the size of supply and demand in the e-commerce market. The weighted price elasticity of demand is large. It indicates that fluctuations in product prices significantly affect the size of demand in the market and that buyers are sensitive to price fluctuations. The low elasticity indicates that the market is in a relatively stable state. Consumer behavior is not unduly influenced by price changes. In general, the elasticity of a product E_d is determined by the time of adjustment by the consumer E_{d1} , the substitutability of the product E_{d2} , the use of the product E_{d3} , the non-essential nature of the product E_{d4} , the proportion of the product in the household expenditure E_{d5} , etc., i.e. $E_d = \{E_{d1}, E_{d2}, E_{d3}, E_{d4}, E_{d5} \dots\}$. The longer the consumer adjustment time E_{d1} examined, the more substitutable the product E_{d2} , the more uses for the product E_{d3} , the greater the degree to which the product is not essential to life E_{d4} , and the greater the proportion of the product in household expenditure E_{d5} , the greater the price elasticity of consumer demand E_d (Figs. 2.5 and 2.6).

Fig. 2.5 Elastic price demand

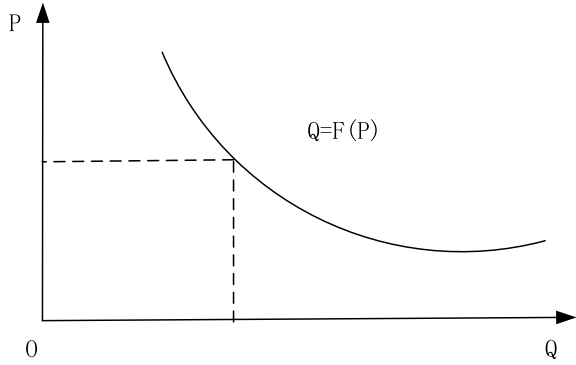
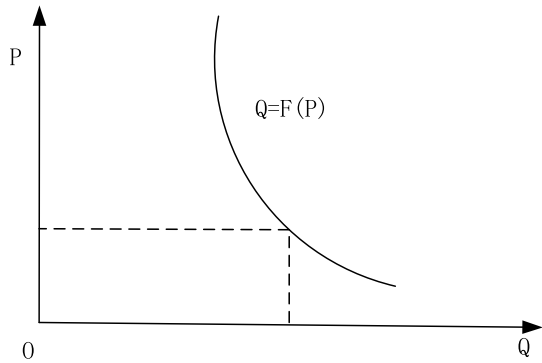


Fig. 2.6 Inelasticity of price demand



We define the total return to the producer by the following equation TR:

$$TR = P \times Q \tag{2.3}$$

where P is the price of the product and Q is the quantity sold.

The elasticity of demand ($Ed > 1$) means that when the price of a product falls, the quantity demanded rises more than the price falls, so that total revenue increases. This is why the phenomenon of “selling more at lower prices” occurs. The inelasticity of demand ($Ed < 1$) means that when the price of a product falls, the quantity demanded increases less than the price falls, so the total revenue from sales falls.

It is important to note that for different consumers, the elasticity of demand for the same type of product may be different, sometimes significantly different. This means that manufacturers can adopt different pricing strategies for different customer segments.

2.2.2.2 Innovation Theory

The theory of innovation first appeared in the writings of Joseph A. Schumpeter. This theory argues that innovation is the essence of economic development and that companies will spontaneously undertake various innovative activities and efforts in order to gain a stronger competitive advantage and reap superior profits. In his book, Schumpeter refers to innovation as the recombination of factors of production and conditions of production. New combinations are introduced into the production system to create new products, new markets, new organizations, new methods of production, and new sources of supply, which lead to more excess profits. Following the scholar's theory of innovation, many scholars have attempted to build on it for further validation and innovation. The main focus has been on both technological and institutional aspects. The two theories of these two areas of debate focus on the determinants of economic growth. The traditional innovation models include two types, namely the incremental innovation model and the breakthrough innovation model. Advances in science and technology and changes in the social environment have brought innovation and its connotations to the forefront, and innovation has taken on a richer and more diverse meaning. It is no longer just the individual behavior of a company in a certain production or business process. It represents the group behavior resulting from the interaction in any space in the network of interaction between innovation agents. Scholars such as Liu Zhiying and Zhu Qingyu have reviewed the development of classical Western innovation theory and pointed out that innovation at the enterprise level $Inv^{(1)}$ includes three themes: innovation management $Inv_1^{(1)}$, innovation model $Inv_2^{(1)}$, and innovation subject $Inv_3^{(1)}$, namely $Inv^{(1)} = \{Inv_1^{(1)}, Inv_2^{(1)}, Inv_3^{(1)}\}$. At the same time, they suggest that a theory of innovation constructed based on the Chinese scenario can be considered in several ways. For example, the dynamic capability of technological innovation and technology strategy, R&D management innovation and open innovation, technology path selection and sustainable innovation, and innovation in the digital transformation of enterprises (Fig. 2.7).

Professor Edison Tse from Stanford University presented the meaning of "source innovation", which he divided into scientific and commercial innovation, and elaborated on it.

Scientific innovation, which refers to the discovery of new laws of nature, includes innovations in scientific theories, products, technologies, etc. For this reason, it is referred to as "original innovation" and is often referred to as "independent innovation" in China. Business innovation consists of two kinds, which are the act of creating new value with the help of science and technology. The first type of innovation is "flow innovation", which is a model of innovation that improves on existing values without making other original changes, such as optimizing existing products, reducing production and operating costs, and improving management. The second type of innovation is "source innovation", which is a completely new innovation that

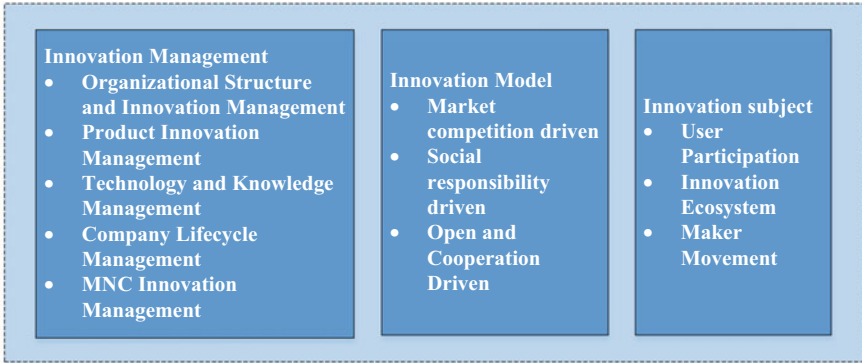


Fig. 2.7 Three themes of innovation theory at the firm level

starts from scratch and builds something from nothing. It represents the development of new ideas and the creation of new values. This model of innovation enables disruptive innovation in demand by combining existing resources.

Source innovation theory is applicable to innovation in new industries with fast-changing market demands, high technological requirements, and strong risk aggregation. Thus, new industries that are integrated with information networks, such as e-commerce, can be interpreted as huge ecosystems $Inv^{(2)}$ built according to the theory of “source innovation”. The key elements are five: the value of new ideas $Inv_1^{(2)}$, two-sided markets $Inv_2^{(2)}$, positive network effects $Inv_3^{(2)}$, interactive innovation between “flow innovation” and “source innovation” $Inv_4^{(2)}$, and the ecosystem $Inv_5^{(2)}$, which is expressed by the formula (Fig. 2.8):

$$Inv^{(2)} = \{Inv_1^{(2)}, Inv_2^{(2)}, Inv_3^{(2)}, Inv_4^{(2)}, Inv_5^{(2)}\} \tag{2.4}$$

2.2.2.3 Theories of Comparative Advantage and Competitive Advantage

Using comparative advantage to analyze national development strategies, the results show that the industrial and technological structure of economies in the country is endogenously shaped by the factor endowment structure. The factor endowment structure is the country’s total budget for production and services in the primary, secondary, and tertiary sectors. The factor endowment structure $E_n^{(e)}$ is a specific factor endowment consisting of natural capital $F_1^{(e)}$, human capital, physical and financial capital, and infrastructure, i.e. $F^{(e)} = \{F_1^{(e)}, F_2^{(e)}, F_3^{(e)}, F_4^{(e)}\}$. To control costs and improve overall competitiveness, it is necessary to upgrade the structure of factor endowments as soon as possible. This can only be achieved by following

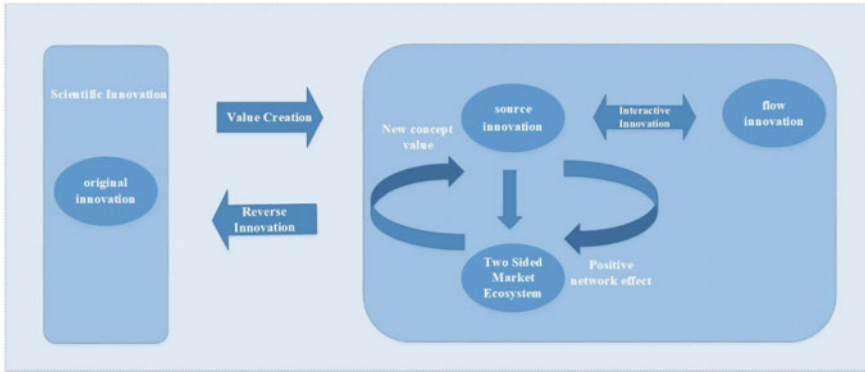


Fig. 2.8 The “Source Innovation” ecosystem

comparative advantages and using more of the country’s relatively abundant factors of production. The same applies to the corporate level.

Generally speaking in a free, open, and competitive market economy, the more consistent the technological choices and comparative advantages are, the greater viability of the firm. The more inconsistent they are, the weaker viability they have. According to Yifu Lin, in a free, open, and competitive market, viability $E_d^{(e)}$ is the ability of a company to earn a normal profit. Whether or not comparative advantage is followed is important for a company to be able to maintain its viability. Firms that do not follow their comparative advantage often face high costs and inefficient production. This often prevents the firm from making a normal profit and thus losing its viability. There are also some companies that do not have viability because the area of origin does not have a comparative advantage.

Thus, it can be summarized that a firm’s resource endowment $E_n^{(e)}$ determines its comparative advantage $C_a^{(e)}$, which in turn determines its viability $E_d^{(e)}$, i.e. $E_d^{(e)} = C_a^{(e)}(E_n^{(e)}(F^{(e)}))$. At both the national social and enterprise levels, each subject follows comparative advantage. Firms that choose the technology with the lowest factor cost per unit of output to produce in this environment are more self-generating, more profitable, and less dependent on external finance. At this point, companies are able to accumulate capital, upgrade their factor endowments, and obtain maximum returns at the fastest rate possible, thus entering a virtuous cycle.

The prerequisite for enterprises and countries to be quite competitive is to follow their comparative advantage. So enterprises need to use their comparative advantage, as determined by the structure of their factor endowments, to choose the right industries and technologies and to accumulate better factors of production. Competitive advantage has a rich connotation and refers to the fact that a company has more advantages in various aspects compared to its competitors, and these advantages can help the company create more value. In terms of competitive advantage, this is outlined in detail by the resource-competence theory $RA^{(e)}$. Based on the resource-based view of the enterprise, American scholar Wernerfel proposed the Resource-Based View. The

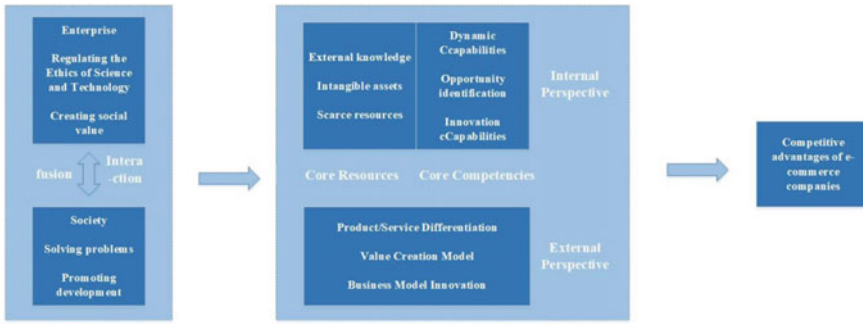


Fig. 2.9 Competitive advantage for e-commerce companies

main point of the theory is that companies are a collection of resources and should focus on how to expand their markets, network important resources, and develop sustainability factors (Fig. 2.9).

The main elements of the resource-based view $R_s^{(e)}$ include three points. The first is the resources of the firm’s competitive advantage $R_{s1}^{(e)}$, i.e. the special heterogeneous resources. The second is the sustainability of a firm’s competitive advantage, the key element of which is the non-replicability of resources $R_{s2}^{(e)}$. Thirdly, it is the acquisition and management of special resources $R_{s3}^{(e)}$. Only good management can maximize the impact of special resources. Thus, the resource-based view can be expressed in the formula:

$$R_s^{(e)} = \{ R_{s1}^{(e)}, R_{s2}^{(e)}, R_{s3}^{(e)} \} \tag{2.5}$$

Resource-capacity theory $RA^{(e)}$ is a concept that adds capacity $A_b^{(e)}$ to the resource-based view $R_s^{(e)}$. The concept of competence takes the form of flows in the process of learning resources and managing them in the company. The resource-capacity theory suggests that the acquisition of economic rents can be analyzed in two ways within the firm. The first is that the firm has a network of many effective resources from various areas. Secondly, on top of having these effective resources, the company must have the strength to make the most of them, i.e. the company needs to have the appropriate expertise and experience, i.e. core competencies. The criteria used by companies to identify core competencies fall into three broad categories. Firstly, core competencies create the possibility of many new product markets for the company $A_{b1}^{(e)}$. Secondly, the core competency provides a more comprehensive use value to the end consumer and the customer’s trust and confidence in the company’s products increase $A_{b2}^{(e)}$. Thirdly, core competencies make the company’s goods or business less likely to be copied $A_{b3}^{(e)}$. Thus, the resource-based view $A_b^{(e)}$ can be expressed in the formula:

$$A_b^{(e)} = \{ A_{b1}^{(e)}, A_{b2}^{(e)}, A_{b3}^{(e)} \} \tag{2.6}$$

Further, the resource-capacity theory $RA^{(e)}$ can be expressed in the formula:

$$RA^{(e)} = (R_s^{(e)}, A_b^{(e)}) \quad (2.7)$$

The paths that companies should take when integrating e-commerce elements should not be the same based on the resources they have at their disposal and their own capabilities. For example, physical e-commerce enterprises should enter into cooperation with other enterprises, using the advantages of cooperative enterprises to optimize their own e-commerce platforms, improve their own service levels and their ability to process and share information, so as to achieve a win-win situation; basic business e-commerce enterprises should open up the scope of their business through cooperation and seek to transform and upgrade their businesses; resource-based enterprises should make good use of the resources at hand and make efforts to build their own e-commerce platform through these resources, thus increasing their competitiveness.

The process of building a competitive advantage for e-commerce companies is the result of collaboration, integration, and application of resources by multiple stakeholders. Therefore, in order to build and maintain a sustainable competitive advantage, e-commerce companies should actively create a digital enterprise ecosystem that attracts other companies to create value together. It is also important to note the significant impact of social issues on corporate behavior and values, with a strong interrelationship between the two. E-commerce companies must therefore make good use of the resources at hand to create economic and social value. Companies need to follow the principles of shared value creation, while incorporating ethical norms of technology into the realm of core competencies. Corporate ethics in science and technology can help companies improve their own core competencies and can also help them create social value. Creating social value is an important source of competitive advantage for companies to maintain.

2.2.2.4 Low-Carbon Economy Theory

In the twenty-first century, the world economy is developing rapidly and global economic integration is accelerating. The traditional development model, with its high carbon content, energy consumption, and pollution, runs counter to today's concept of green and sustainable development. How environmental issues can be compatible and synergistic with development is an important issue. The concept of a 'low-carbon economy' was first introduced by Kinzig and Kammen. *The White Paper on Energy* defines a low-carbon economy as a new model of economic development marked by the application of low-carbon technologies and the development of new energy sources. This model reduces municipal waste emissions and energy while providing a more low-carbon production environment and sustainable development opportunities. Rubinstein goes further to explain the low-carbon economy: it is a new model of economic and social development that exists within the framework

of socialist market mechanisms, in an environment of institutional innovation and rational policy-making, with “low pollution x_{p1} , low consumption x_{p2} , and low emissions x_{p3} ” production and consumption X_p , i.e. $X_p = \{x_{p1}, x_{p2}, x_{p3}\}$, to achieve “high performance y_{d1} , high efficiency y_{d2} , and high effectiveness y_{d3} ” of human society Y_d , i.e. $Y_d = \{y_{d1}, y_{d2}, y_{d3}\}$. By putting the whole process into the equation, it can be described as

$$Y_d = f(X_p) \tag{2.8}$$

At present, there are two main interpretations of what a low-carbon economy means by scholars. One definition revolves around the goal of a low-carbon economy. This view is that a low-carbon economy is not related to economic growth, and that the purpose of this economic model is to promote long-term sustainable human development through joint efforts, which should not lead to a reduction in human living standards. The other is that the key to a low-carbon economy is low-carbon technology. The division of the low-carbon economy sector should be based on the classification of low-carbon technologies. To drive the development of a low-carbon economy, it is necessary to enhance the effective use of new energy sources and technological upgrading. Wang Mengxia also summarized the low-carbon pathway options for companies as follows (Fig. 2.10).

In terms of low-carbon products, China’s products have gone through a process of low carbonization from green products to energy-efficient products and finally upgraded to environmental labeling products. In the future, low-carbon products should first be selected from the most comprehensively developed environmental labeling products for gradual improvement. Green products are a reflection of the application of green technology. According to Liu Yue, a green product is a product that has chosen environmentally friendly materials, structures, and processes that produce no or less toxic side effects on the environment throughout the production and sales cycle, minimizing the impact on the environment and minimizing the consumption of production resources. Liu Qian and others point out that the development of energy-efficient products should meet the needs of energy, economy, and environment at the same time. The current evaluation criteria for energy-efficient products in China do not yet cover the entire production and sales process. Only products that are energy efficient throughout the entire process can be considered truly energy efficient. Low-carbon products are the endpoint of a low-carbon economy.



Fig. 2.10 Low-carbon path options for businesses

The core element of promoting a low-carbon economy from the endpoint is the development of various relevant standards, such as energy-saving product standards, environmental labeling product standards, and low-carbon product standards. At the same time, energy-saving and low-carbon products need to be vigorously promoted, produced, and marketed to replace ordinary products. By increasing the proportion of energy-saving and low-carbon products in the total product mix, we promote the optimization of product and industrial structures and the development of a low-carbon economy and low-carbon cities.

For low-carbon industries, more emphasis is placed on targeting industrial structure and ratio, application of low-carbon technologies, support of advanced equipment, process optimization, etc. The development and application of various new technologies, techniques, and methods for energy conservation and emission reduction to reduce energy consumption and emissions, and to reduce costs, thus achieving low carbon. The central idea of a low-carbon economy is energy saving and emission reduction with the aim of sustainable and healthy development. Efforts are made in the areas of technology, systems, and raw material development to give maximum environmental support to reduce the pressure on energy. On this basis, we promote the joint development of social and economic synergy with ecological and environmental protection.

E-commerce businesses need to maintain their core competencies if they want to sustain healthy growth and gain more profits. In addition, it also requires proper planning of all the assets, resources, and overall structure of the enterprise. And among the development of e-commerce enterprises in line with the times, the low-carbon economy has formed a special kind of competitiveness, low-carbon competitiveness. This competitiveness includes resource competence, technical competence, management competence, and environmental competence.

A low-carbon economy is not only conducive to the core competitiveness of e-commerce enterprises in the new economic environment, but also meets the requirements of low carbon and environmental protection in sustainable development. On the one hand, in the theoretical environment of low-carbon economy, the core competitiveness of e-commerce enterprises is closely related to low-carbon capability, which can ensure the sustainable profitability of enterprises in the development process. At the same time, enterprises can obtain support in various areas by responding to the various policies under the government's call. Comply with the international development trend, break the trade barriers, and meet the low-carbon requirements of enterprises. Further, expand the scope of cooperation and enhance the competitiveness of enterprises themselves at home and abroad. As a result, the brand reputation and influence of e-commerce companies will increase with low-carbon capacity. These two will greatly enhance the core competitiveness of the enterprise. On the other hand, some of the industries in the e-commerce business involve high energy-consuming links. For example, the logistics industry has a high energy consumption and harmful gas emissions in the transportation of products, which is not in line with the principles of a low-carbon economy. Therefore, it needs to be dealt with in a targeted manner using advanced science and technology. In the process of e-commerce development, enterprises need to adhere to the development of a

low-carbon economy, put environmental awareness at the forefront, and respond to the requirements of ecological civilization construction and development. In this context, the low-carbon development of e-commerce will save significant resources. This is in line with the requirements of low-carbon environmental protection and sustainable development strategies and will contribute to the mitigation of global climate problems.

2.2.3 Platform Theory

2.2.3.1 Two-Sided Market Theory

A two-sided market, also known as a two-sided network, is a platform on which one or several users end up trading, and which keeps all parties on the platform through appropriate charges to each party. Since then, researchers have developed the “non-neutral price structure” theory of two-sided markets. Considered in terms of network externalities, a two-sided market is a market in which two heterogeneous segments of participants are connected and traded through a platform. The returns of one part of the market are highly correlated with the number of participants in the other part. In a nutshell, a two-sided market is a trading platform in the midst of an Internet environment that provides services to both parties. As an intermediary, the two are tightly linked through the platform by means of platform price adjustments and a system of platform participation for buyers and sellers, where the benefits of one party are tied to the quantity of the other.

There are three types of market players in the bilateral market, including platform operators $b_i^{(t)}$ and two types of platform users $c_{ij}^{(t)}$ (buyers and sellers of transactions, program developers, and users). In addition, bilateral users have an advantage over unilateral markets in terms of the type of interaction and the number of participants. Platform companies and bilateral platform users constitute a two-sided market, the structure of which is shown in the diagram below. It can be seen that the platform companies are at the focal point of the bilateral market and are the basis on which the bilateral market is maintained. Platform user group A and platform user group B drive the bilateral market in the marketplace. The central platform acts as an intermediary for communication between the bilateral markets. In the e-commerce domain $r_{ij}^{(t)}(I)$, the function has a value domain of $\{0,1\}$, where I represents the full information set, which includes all information, such as the net assets, equity structure and net income of the platform, the assets of the platform users, and the level of knowledge about the platform. Therefore, with reference to the diagram below, the relationship between the platform company and user groups A and B can be exemplarily represented as $r_{i1}^{(t)}(I), r_{i2}^{(t)}(I)$ (Fig. 2.11).

There are three types of two-sided markets, audience-creating, market-creating, and demand-coordinating. Audience-creating two-sided markets rely heavily on the number of users. Only when the number of platform users reaches a certain size can relevant companies be attracted to the platform. A market-creating two-sided market

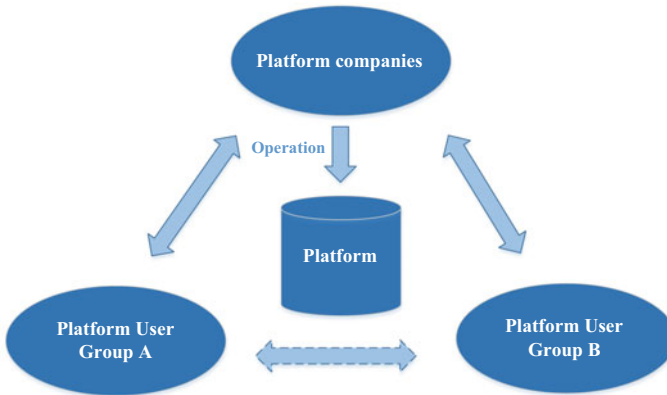


Fig. 2.11 Structure of the two-sided market

is one in which the two parties to a transaction are closely linked. As the number of users on one side increases, the utility of the platform and the other side increases, thus increasing the efficiency of transactions on the platform. In contrast, the harmonized demand-based two-sided market is primarily used to meet the differentiated needs of bilateral users.

Two-sided markets have properties $B^{(m)}$ including network externalities $B_1^{(m)}$, asymmetric pricing $B_2^{(m)}$, demand dependence $B_3^{(m)}$, supply regulation $B_4^{(m)}$, and multi-platform access $B_5^{(m)}$, namely $B^{(m)} = \{B_1^{(m)}, B_2^{(m)}, B_3^{(m)}, B_4^{(m)}, B_5^{(m)}\}$. (1)

Network externalities $B_1^{(m)}$. A network externality is a positive relationship between the utility gained by a user in the use of a product or service and the total number of users. That is, the higher the number of users, the higher the utility gained by the users. Network externalities in a two-sided market environment can also be called cross-network externalities. Both sides of the users connected by the platform are connected in some way, and an increase in the number of users on one side leads to an increase in the utility of users on the other side. (2) Asymmetric pricing $B_2^{(m)}$. The bilateral market pricing model differs from the traditional pricing model in that there are three main influencing factors: marginal cost on both sides of the platform, network externalities on both sides, and the price elasticity of demand. The higher the price elasticity of demand on one side of the platform, the lower the network externality it has on the other side of the platform. And the higher the marginal cost on one side of the platform, the higher the pricing on that side. Thus, we often see platforms attracting consumers with low prices and making promises, while at the same time, the platform charges the merchant a fee. (3) Demand dependence $B_3^{(m)}$. Users on both sides of the platform are dependent on the products or services offered by the platform. Their needs cannot be met or fulfilled elsewhere than on the platform. The demand of the platform merchant is the need to satisfy the demand of the consumer, and the demand of the consumer is the need for the products and services on the merchant's side. The two are linked together by the products and services in

the platform and satisfy each other's needs through the platform. If either side of the platform is missing, such a demand will not exist, meaning that the products and services offered by the platform are not independent. (4) Supply regulation $B_4^{(m)}$. Platforms in the marketplace want to pursue more benefits and achieve their own pursuits; they need to meet the needs of bilateral users, reduce transaction costs, and improve transaction efficiency. In this process, the platform does not have to think too much about the value of both users. However, because bilateral users have different aspirations, platforms need to employ various means to manage the balance between insufficient and excessive demand. At the same time, sunk cost is high and the upfront operational risk is high due to the existence of economies of scale on the platform. (5) Multi-platform access $B_5^{(m)}$. Driven by the desire to maximize profits, bilateral users of platforms often trade on multiple platforms. This seriously affects the pricing of products and the choice of competitive strategies by platforms in two-sided markets. Products and services can also be characterized by strong substitutability due to the non-exclusivity of bilateral users. However, if two-sided markets are not characterized by multi-platform access, platforms also face a new dilemma, namely the apparent cap on user scale expansion.

2.2.3.2 Platform Economy Theory

As a new economic development concept, the platform economy is the sum of all network-based relationships of economic activity. For the companies involved in the platform economy, the model manifests itself as a new economic development model that forms an effective two-sided or multilateral market by means of information matching, which in turn leads to a new economic development model with a cross-border network effect. It can also be seen as a new economic interaction infrastructure, the logic of which is shown in the diagram (Fig. 2.12).

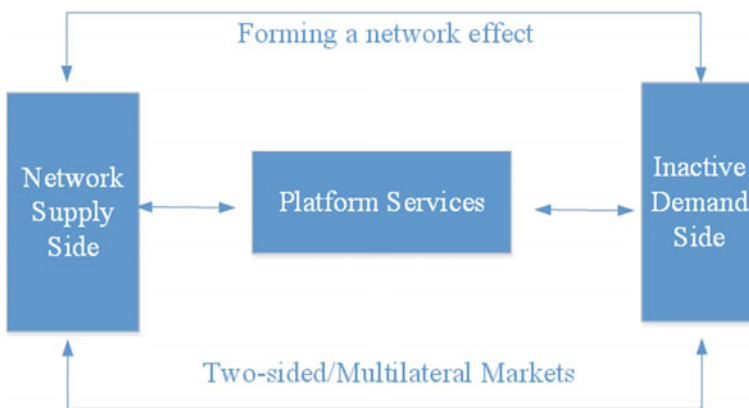


Fig. 2.12 The logic of forming a platform economy

In the platform economy ecosystem, the platform operator (platform company) $b_i^{(p)}$ is still the core. The rest of the participants, whether from the supply side of the network or the idle demand side, are collectively referred to as platform users $c_j^{(p)}$. In the e-commerce domain $r_{ij}^{(p)}(I)$, the function has a value domain of $\{0,1\}$, where I represents the full information set, which includes all information, such as the net assets, equity structure and net income of the platform, the assets of the platform users, and the level of knowledge about the platform. $r_{ij}^{(p)}(I) = 0$ means that the platform enterprise $b_i^{(p)}$ and the platform user $c_j^{(p)}$ cannot conduct e-commerce transactions if the information I is known. $r_{ij}^{(p)}(I) = 1$ means that the platform enterprise $b_i^{(p)}$ and the platform user $c_j^{(p)}$ can conduct e-commerce transactions if the information I is known.

The transaction relationship between the platform enterprise $b_i^{(p)}$ and the platform user $c_j^{(p)}$ is defined as $R^{(p)}(I)$, and the elements of row i and column j of the matrix are $r_{ij}^{(p)}(I)$.

$$R^{(p)}(I) = \begin{pmatrix} r_{11}^{(p)}(I) & r_{12}^{(p)}(I) & \cdots & r_{1j}^{(p)}(I) \\ r_{21}^{(p)}(I) & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & \vdots \\ r_{i1}^{(p)}(I) & \cdots & \cdots & r_{ij}^{(p)}(I) \end{pmatrix} \quad (2.9)$$

There are five key features of the platform economy. First, scale economies. The previous summary talked about the long-tail effect, whose basic feature is the addition of new services to the established platform. It does not substantially increase its marginal cost. This not only allows the platform to scale easily, but also does not entail too high a marginal cost. As a result, larger companies will be more productive and more competitive. Secondly, economies of scope. It is cheaper to produce multiple products simultaneously than to produce individual products separately. It follows that companies producing multiple products are more efficient and have a wider range of business than those producing a single product. Due to the economies of scope, it becomes very common for platforms to start expanding their business as soon as they are established. Thirdly, network externalities. This is primarily an economy of scale on the demand side. That is, the more consumers there are, the higher the value of use per capita. There are two main reasons for network effect externalities, one is that the influx of consumers increases the size of the market, thus providing consumers with the opportunity to be able to enjoy better quality services. The second is that the increased market size provides further incentives for platforms to innovatively offer more and better services. Fourthly, the dual/multilateral marketplace. Instead of facing only buyers and sellers, platforms have to provide services for multilateral parties. For example, a trading platform for second-hand goods faces both sellers and buyers, as well as third-party appraisers. The platform's price for each counterparty is inversely related to its revenue, so the platform needs to consider the impact on

the other party when pricing one party. Fifthly, big data analytics. Digital platforms are significantly better than traditional platforms in terms of scale, speed, and data. These features allow platforms to break through the constraints of time, space, and location. As a result, digital platforms offer enormous advantages in terms of the transmission, analysis, collection, and use of information.

The platform economy model represents the new productivity in the digital economy era and is a synthesis of the Internet economy. In the traditional e-commerce industry, platforms play the role of connecting producers and consumers, while also creating value. Firstly, the e-commerce model under the platform economy is more flexible due to the way production and organization are carried out. Consumer needs are met in many ways, including upgrading needs and personalized needs. It also solves the problem of the traditional economic model where flexible manufacturing is not possible if the scale is too small. For example, data analysis and processing are used to allocate resources across the chain. The overall production capacity is increased and the scope of production of the company is expanded. Secondly, the platform economy model can enrich the e-commerce industry chain, provide one-stop services, and fundamentally connect upstream and downstream enterprises to reach a win-win situation. One of the most popular strategies is the ecosystem strategy. By implementing this strategy, platforms offer other types of products and services in addition to the basic online trading services and at a lower cost. At the same time, the platform will change its strategy according to the scale of its users. Incubating new businesses or industries based on customer demand can effectively drive innovation in the e-commerce model. Thirdly, the technological advantages of the platform economy will give the e-commerce industry the function of sensitization, which is conducive to product and service innovation of enterprises. With the addition of technologies such as big data, blockchain, and cloud computing, the interactive function of consumer information data is revealed. The analysis of information after it has been datafied allows e-commerce companies to keep abreast of consumer data. The consumer shopping experience is optimized.

2.2.3.3 Sharing Economy Theory

The sharing economy, which is also a collaborative consumption economy, was first proposed by the American sociologist Felson. The sharing economy is built on the basis of the mobile Internet. The connotation is an economic model in which the right to use idle resources or services is temporarily transferred by posting information on an online intermediary platform, for which a certain amount of financial compensation is received. The sharing economy offers consumers more individual goods and services in a precise and timely manner. At the same time, it can make full use of unused resources to exploit them effectively.

The essence of the sharing economy is to enhance the utilization of unused resources or services by matching supply and demand. From a supply-side perspective, the sharing economy is about identifying one's own supply needs and transferring the use of idle resources or services for a specified period of time through

matching, while obtaining a certain financial return. From a demand-side perspective, the sharing economy is about having a relevant need for a resource or service without having to acquire ownership of it. The right to use it can be obtained temporarily for a small amount of money. The development and evolution of the sharing economy, in fact, is a process of disintermediation and re-intermediation. De-intermediation means that supply and demand are matched and dovetailed directly, without the need for a third-party platform to play a role between the two, in order for products and services to be offered and received. Re-intermediation is based on re-intermediation, in order to make the supply and demand sides understand each other and trust each other more, the two sides will be connected together to the shared platform, to achieve the accuracy and efficiency of the matchmaking. The aim of re-intermediation is therefore to expand the frequency and area of contact between supply and demand and to improve the efficiency of matching supply and demand.

The sharing economy ecosystem $S^{(e)}$ consists of four elements. The first is the public $S_1^{(e)}$, which is currently dominated by individuals $S_{11}^{(e)}$, but in the future will be extended to companies $S_{12}^{(e)}$, governments $S_{13}^{(e)}$, etc., i.e. $S_1^{(e)} = \{S_{11}^{(e)}, S_{12}^{(e)}, S_{13}^{(e)}, \dots\}$. Secondly, spare resources $S_2^{(e)}$, mainly including money, houses, cars, and other goods $S_{21}^{(e)}$, and personal knowledge $S_{22}^{(e)}$, skills $S_{23}^{(e)}$, and experience $S_{24}^{(e)}$, i.e. $S_2^{(e)} = \{S_{21}^{(e)}, S_{22}^{(e)}, S_{23}^{(e)}, S_{24}^{(e)}, \dots\}$. Thirdly, social platforms $S_3^{(e)}$, which mainly refer to platforms that have been shared on a large scale using Internet technology. Fourth, income generation $S_4^{(e)}$. There are three basic models: online renting $S_{41}^{(e)}$, online second-hand trading $S_{42}^{(e)}$, and online odd jobs $S_{43}^{(e)}$, namely $S_4^{(e)} = \{S_{41}^{(e)}, S_{42}^{(e)}, S_{43}^{(e)}, \dots\}$. These three are also the basic sharing models. That is to say, the absence of even one of these three basic models may not be the sharing economy we are concerned with. It is important to note that the three models mentioned here are primarily for individual participants. Internationally, the phenomenon of corporate and government participation has now emerged. So the sharing economy will be further enriched. Thus, the sharing economy ecosystem $S^{(e)}$ can be expressed by the formula (Fig. 2.13):

$$S^{(e)} = \{S_1^{(e)}, S_2^{(e)}, S_3^{(e)}, S_4^{(e)}\} \quad (2.10)$$

In terms of industry coverage, the sharing economy is also accelerating its penetration into many areas of people's clothing, food, housing, and transport, profoundly changing the way people produce and consume. The sharing economy currently covers various areas such as education and teaching, food, logistics and storage, logistics and transport, infrastructure, urban construction, and finance. The main actors involved in sharing are also moving from individuals to inter-company. The sharing economy has made a significant contribution to the repair and reshaping of the national economy and is shaking the foundations of traditional economic theory. There is an increasing tendency to think in terms of collaborative sharing. No longer

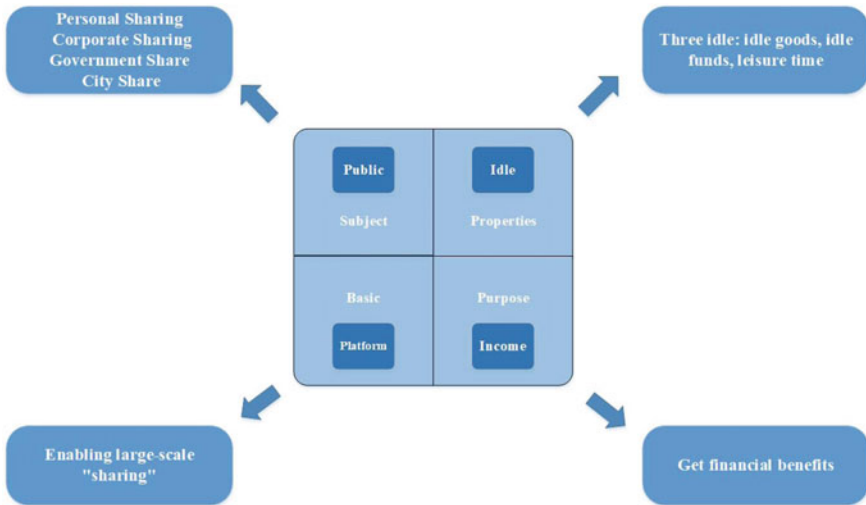


Fig. 2.13 The four elements of the sharing economy ecosystem

limited to the ownership of products and services, the emphasis is more on the temporary ownership of products and services.

2.2.3.4 Symbiosis Theory

The concept of symbiosis was born in the biological world. It is generally accepted that symbiosis refers to different species living together in some kind of material association, forming a relationship of co-survival, co-evolution, or suppression. And there are three main elements that symbiosis encompasses. One is the symbiotic unit, which is a basic unit of energy generation and exchange. It is the basic material condition for the formation of a symbiosis. Second is the symbiotic pattern, which reflects the relationship between the symbiotic units in terms of material information exchange, interactions, bonding, and energy conversion. The third is the symbiotic environment, which is the collection of all factors other than the symbiotic unit (Fig. 2.14).

A symbiotic system $S^{(s)}$ is a system formed by symbiotic units in a certain symbiotic environment according to a certain symbiotic pattern, as shown in Fig. 2.1. In Fig. 2.1, E_1, E_2, \dots, E_i denotes the symbiotic environment, U_1, U_2, \dots, U_j denotes the symbiotic unit, and M_1, M_2, \dots, M_n denotes the symbiotic mode. In symbiotic systems $S^{(s)}$, there are differences between the symbiotic environment E_i , the symbiotic unit U_j , and the symbiotic mode M_n . The symbiotic relationship formed between the symbiotic units can be represented by the degree of symbiosis between the symbiotic units. The symbiotic system $S^{(s)}$ is expressed by the equation:

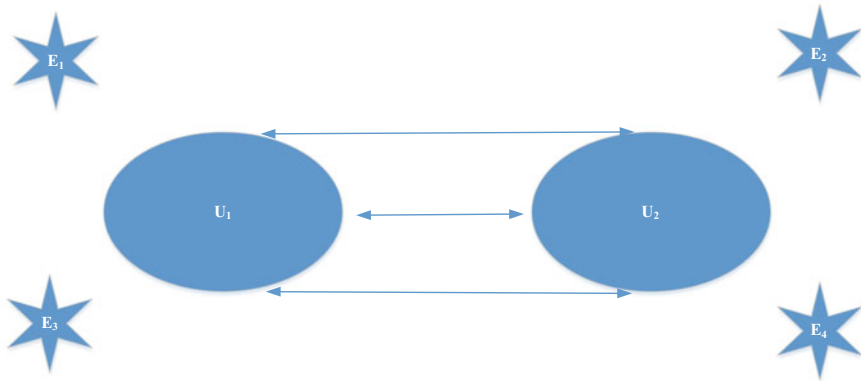


Fig. 2.14 Symbiotic system element relationships

$$S_{ijn}^{(s)} = \{E_i, U_j, M_n\} \tag{2.11}$$

Industrial symbiosis within a company between sectors, between companies, or between regions will cover many symbiotic units. Under the constraint of a symbiotic nature, it may be possible for either separate industry module A or B to exist independently. And when industry modules A and B are present at the same time, there will be at least one industry module A or B dependent on industry module B or A. The symbiosis model includes the symbiotic organization model and the symbiotic behavior model. Depending on the symbiotic organization and symbiotic behavior, different subjects in the same symbiotic relationship also have corresponding symbiotic characteristics, as shown in Figs. 2.15 and 2.16.

Breakthrough ideas can be sought to promote the symbiosis of companies in the e-commerce sector. Firstly, promote the opening up of ecosystems and the enrichment of species, thus optimizing the structure of ecosystems. Similar to the diversity of species in nature, the e-commerce ecosystem requires a diversity of companies, models, and strategies to optimize the structure of the system. As the leading species of the ecosystem, it needs to recognize the importance of the platform and give full play to its role. Timely adjustments need to be made in strategies to make the platform more open according to development needs. A more diversified ecosystem

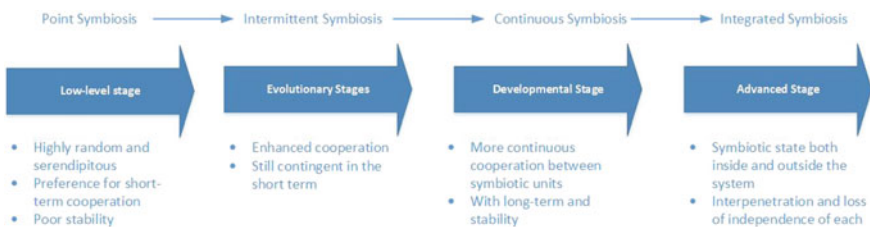


Fig. 2.15 Symbiotic organization model

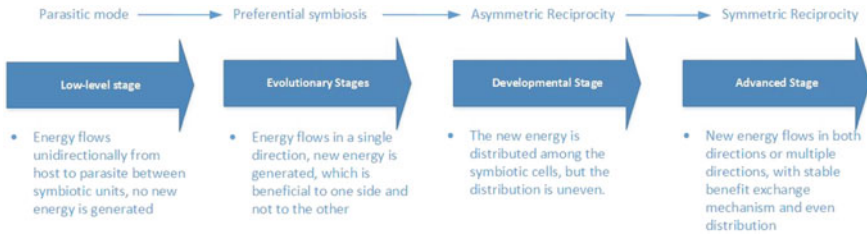


Fig. 2.16 Symbiotic behavior patterns

also encourages companies in the symbiotic system to improve their competitiveness through rational market positioning and business model innovation based on their respective comparative advantages. For example, leader species can effectively integrate system resources and promote deeper and wider ecosystems through new circulation models. By expanding the market space in this way, more species are attracted and accommodated to participate. Ultimately, the structure of the ecosystem is optimized and the healthy development of the ecosystem is promoted. Secondly, promote the sharing of various types of resources, improve relationships between species, and enhance ecosystem function. With the separation of resources, there is a high degree of randomness in the symbiosis of enterprises, poor interdependence, and symbiotic stability, and it is difficult to improve ecosystem function. And the sharing of resources among companies in a symbiotic system can enhance operational synergies between companies. It facilitates the formation of a full supply chain, which ultimately enhances the value-added space. Therefore, leadership populations should break down the barriers between different species. Promote a shift in the symbiotic interface of companies in symbiotic systems from purely “exogenous interfaces” such as markets to “strong endogenous interfaces” such as trust and practices. In particular, it is important to promote a reduction in the dependence of other species on the leader species. There should be a shift in the relationship with the leader species from a subordinate network relationship to a self-organizing network relationship. This will enable the rapid formation of information communication, resource sharing, and value transfer between other species. And based on this work together to improve strength and even form the brand effect of self-organized clusters. As a result, species within the ecosystem co-evolve based on resource sharing and deep collaboration, enhancing ecosystem function. Economies of scale and scope can be realized while creating more value for consumers.

2.3 Summary of this Chapter

In general, the interplay of “information flow, capital flow, and logistics” is always present in e-commerce. China has certain comparative advantages in the field of e-commerce. Supporting these industries with comparative advantages and nurturing

them to become core competitive industries both internationally and domestically require the combined action of the invisible hand of an “efficient market” and the invisible hand of a “promising government”. “Efficient markets”, which enable companies to make decisions based on price signals; and “promising government”, which relies on efficient markets to help companies overcome market failures and hedge against various cyclical fluctuations and shocks.

This chapter summarizes the basic theories of e-commerce under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era. It is a comprehensive overview of the laws, regulations, policies, and other doctrines of the “visible hand” of government. It also compares the theories on the demand side, supply side, and platform side of the “invisible hand” of the market. The principles of “active government” and “efficient markets” are explained in depth and how they work together in the field of e-commerce. A country can achieve faster, more inclusive, and sustainable growth and development by using the two hands of the market and the government simultaneously. Only with the joint efforts of an “efficient market” and a “promising government” will enterprises be able to achieve longer-term development in this track of e-commerce. Only then can we help China become a major economic power in the world and contribute to the great rejuvenation of the Chinese nation (Fig. 2.17).

Today, e-commerce has injected new dynamism into four areas: production, trade, distribution, and consumption. The internal operational elements have undergone a huge transformation and innovation. In the production chain, enterprises have used emerging technologies and tools such as big data, cloud computing, and the Internet of Things to achieve self-reinvention of e-commerce production models as well as iterative product innovation. The personalized and diversified needs of consumers are met. In the transaction chain, e-commerce platforms and various technology

Fig. 2.17 Basic theoretical framework for e-commerce



service providers are interconnected, building new information bridges and transaction channels for producers and consumers; at the same time, technological integration continues to give rise to new e-commerce transaction models, and the e-commerce ecosystem continues to expand. In the circulation chain, e-commerce reshapes the circulation chain, changes the “three streams” model, promotes circulation organization innovation, reduces costs, and increases efficiency in the circulation chain. In the consumption segment, the new e-commerce model has pushed consumer society to mature, with changes in consumer psychology and the formation of new consumer characteristics. At the same time, technological advances have driven innovation in consumption models and changed traditional consumer behavior. The two changes work together in the production chain, putting forward new requirements for production models and products. In summary, e-commerce economic activities form a closed loop.

Therefore, only under the joint action of “effective market” and “competent government”, can we deeply understand the basic principles of e-commerce, master the operation mode of e-commerce, and give full play to the advantages of e-commerce features. Only then can we ensure the unimpeded flow of production, transaction, circulation, and consumption in economic activities, complete the rebuilding of the industrial base and innovation of the industrial chain, and truly promote the reform and innovation of the supply side, the empowerment, and upgrading of the intermediate links and the quality and expansion of the demand side.

2.4 Review Reflection Questions

1. Please talk about your understanding of the relationship between the guiding ideology of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era and e-commerce. Briefly describe the main objectives and major development tasks of the 14th Five-Year Plan for e-commerce.
2. How do you understand e-commerce sector policies? What are the specific elements?
3. What are the tax-related regulations in *the E-Commerce Law of the People's Republic of China*? Please give examples.
4. What are the current initiatives for collaborative e-commerce regulation in China?
5. Please tell us your understanding of the e-commerce talent policy, anti-trust policy, and intellectual property policy, respectively.
6. What is the Long-Tail Theory? What is the principle of the Long-Tail Theory?
7. What is consumer behavior theory? Please talk about your understanding of the AISAS model.
8. What is Maslow's Hierarchy of Needs? Please briefly describe the application of the five levels to the field of e-commerce.
9. Briefly describe the theory of price elasticity of demand. Talk about your understanding of price elasticity of demand and price inelasticity of demand.

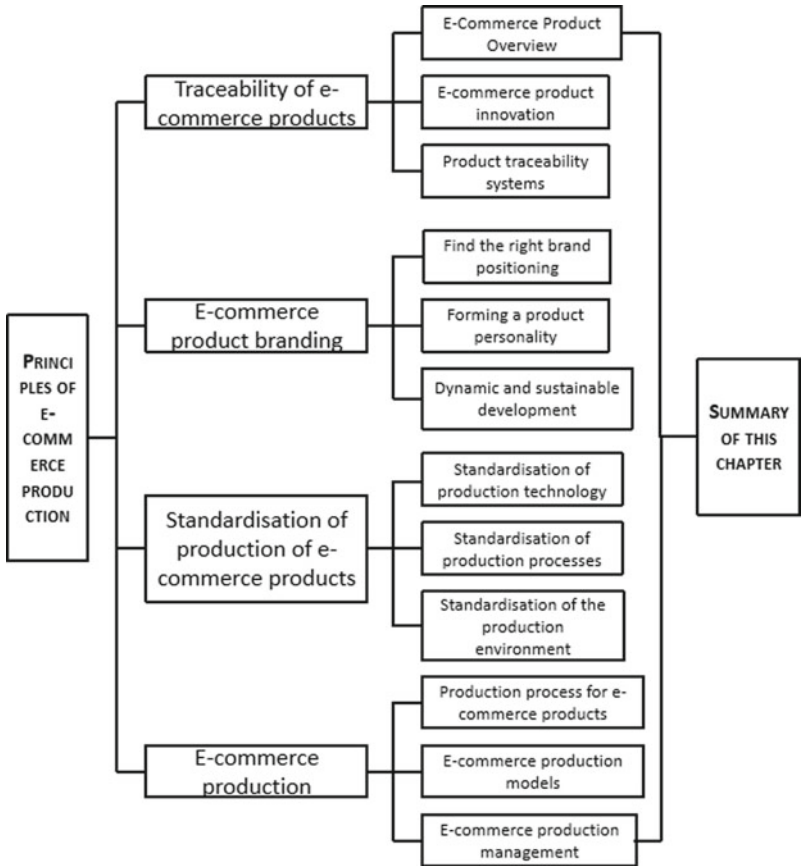
10. Briefly describe the theories of innovation, comparative advantage, and competitive advantage. Discuss your understanding of the application of each of these theories to the practice of e-commerce.
11. Please briefly describe the theory of low-carbon economy. Talk about what options there are for low-carbon pathways for businesses.
12. What are the principles of the two-sided market theory and the platform economy theory, respectively? What is the difference between the two? Please discuss your understanding.
13. Please provide a brief description of the four elements of the sharing economy.
14. How do you understand symbiotic systems? Please briefly describe each of the four stages of the symbiotic organization model and the symbiotic behavior model.
15. What role do “efficient markets” and “promising government” play in making China a major economic power and in realizing the Chinese dream?

Chapter 3

E-Commerce Technology Principles



Knowledge Map of this Chapter



A Thirty-Year Review of E-Commerce in China

In 1990, the State Planning Commission and the Science and Technology Commission began to attach importance to e-commerce. EDI was included in the national science and technology research projects. The newly established “China Coordination Group for the Promotion of EDI Applications” promoted the development of e-commerce, marking the beginning of China’s e-commerce. In this stage, around the EDI network for remote data exchange, the offline commodity trading activities are transplanted to online; therefore, the EDI system operation is very complex, and e-commerce is only in a small range.

In 1993, the State implemented the “Three Golden Projects” (Golden Bridge, Golden Card and Golden Customs), in which the “Golden Bridge” project was to strengthen the communication network, and the “Golden Card” project was to improve the electronic payment of money, and the “Golden Customs” project is to improve the country’s foreign trade capacity. The “three gold projects” have laid a solid foundation for the development of e-commerce and made e-commerce transactions possible and safe.

At the same time, computer technology, especially digital media technology, further developed, and the advantages of advertising in the network environment gradually came to the fore. In 1997, INTEL and IBM placed online advertisements on www.chinabyte.com, the first commercial advertisement in China. In the same year, ChemNet China, the first business-to-business e-commerce website in China, was put into operation to guarantee the smooth implementation of e-commerce by the credibility of enterprises. In 1998, facing the more extensive business-to-person merchandise transactions in the retail market, the 8848 websites were put into operation as the first e-commerce platform for the retail market. Online shopping entered the stage of practical application.

Entering the 21st century, mobile communication technology has entered 4G from 3G and has now entered the 5G era. The development of mobile communication technology not only makes mobile devices such as cell phones have high-speed data transmission capability but also makes the bottleneck problem of traditional wired network coverage effectively solved; based on the development of mobile device technology, mobile software technology has been developed rapidly, and various APPs are widely used for E-commerce transactions, payments, information services, etc. The application of WeChat official accounts and minor programs alleviates the problem of APPs redundancy in smartphones. And it also good for mobile commerce.

In 2020, the national e-commerce transactions reached 37.21 trillion yuan. The State Council further emphasizes the development of the digital economy, the Ministry of Industry and Information Technology, the Ministry of Commerce, the Ministry of Transportation and other departments of the “14th

Five-Year Plan” related to the goal, 2025 will achieve the digital economy accounted for 10% of the gross domestic product (GDP), reaching 46 trillion yuan.

3.1 E-Commerce Network Technology

The transactional activities of e-commerce can be described as

$$EC^S = EC^M \times EC^C \text{ st. } SE \xrightarrow{EC} BU \text{ and } BU \xrightarrow{EC} SE$$

Where EC^S represents e-commerce transaction systems, EC^M represents the information sets, EC^C express the collection of information transmission channels in e-commerce, SE is the information sender, and BU is the information receiver. That is, e-commerce is the interaction of information in the communication system between SE and BU according to the established objectives.

Communication networks for e-commerce $EC^C = \{EC_1^C, EC_2^C, \dots, EC_n^C\}$. In particular, when $n = 3$, EC_1^C is the communication network at the supply side of e-commerce, such as the IoT and blockchain network for collecting information and protecting the validity of information; EC_2^C is the communication network for commodity transaction negotiation, such as mobile communication network, broadband network, etc.; EC_3^C is the network at the top layer of commodity transactions, such as the Internet and EDI network. With the completion of the commodity trading chain, each segment of the communication network in the actual e-commerce transaction is connected by several pieces of communication networks.

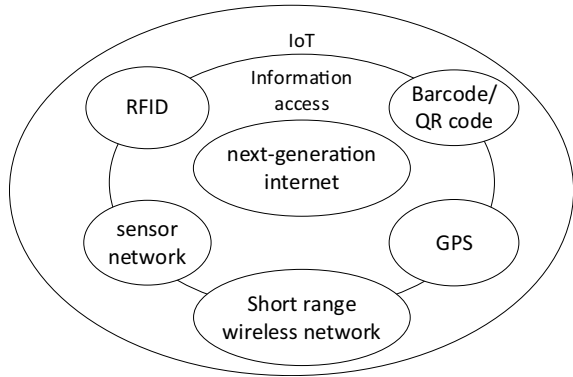
3.1.1 IoT and Blockchain Network Technology

3.1.1.1 IoT Technology

According to the concept of IoT proposed by Kevin Ashton in 1998, if the access devices of the IoT are considered nodes and the connections between nodes in the IoT are considered edges, the IoT is formally defined as.

The IoT is an undirected graph $G = \langle V, E \rangle$, where V denotes the set of nodes of the IoT with m nodes and $V = \{v_1, \dots, v_i, \dots, v_m\}$, v_i is the access item in the IoT; the communication between things is the connection between nodes and nodes, i.e. the edges of the undirected graph, set as E , then E is the set of advantages $E = \{(v_i, v_j) | v_i \in V, v_j \in V\}$, each edge (v_i, v_j) represents the existence of communication between two nodes.

Fig. 3.1 The conceptual model of IoT



The Internet of Things (IoT) has been widely focused on in China since August 2009, when Premier Wen Jiabao proposed “Sense China” and listed it as a strategic industry. Subsequently, the connotation and extension of IoT have expanded from RFID technology to a broader scope, and the types of IoT nodes have become more abundant. Information sensing devices such as RFID, infrared sensors, and GPS are used to realize the transmission of terminal information to IoT through software according to IoT access protocols. They are transferred to LAN or Internet information systems for information exchange and communication to realize intelligent identification, positioning, monitoring, and management. The conceptual model of IoT is shown in Fig. 3.1.

Due to the complete access of sensing devices on IoT and its integration with the Internet, the concept of IoT is divided into two aspects: broad IoT and narrow IoT. The overall IoT is equivalent to the “Internet of the future” or “ubiquitous network”, which includes the development of the Internet. The broad IoT enables people to excel Internet and change information between things in any way, at any time, anywhere, on any network. The narrow IoT is a network of objects connected by sensors, such as ETC (Electronic Non-Stop Charging System).

IoT comprehensively introduces sensing devices to sense terminal information and provide initial data for e-commerce, an economic activity. IoT is also the front-end network technology in e-commerce.

1. Characteristics of the IoT

Considering the IoT as a system, the IoT system is a tuple: $\text{IoT} = \langle \text{AS}, C, \text{AI} \rangle$, where:

- (1) $\text{AS} = \{as_1, \dots, as_r\}$, IoT sensing subsystem for comprehensive sensing of information required for e-commerce activities. AS is a collection of various sensing objects whose sensed information is essential for e-commerce economic activities. These devices are RFID, sensors, QR codes, and possibly other types of sensors in the future. There are many types of sensors connected to the IoT, and each sensor collects data on different aspects of the business according to the user’s needs; therefore, each sensing device is a source of information,

and since data are collected on various objects or multiple aspects of the same thing, the IoT obtains data through sensing devices with different types, different contents, and different formats. The primary feature of IoT is the comprehensive sensing and real-time collection of information through various sensing devices. Compared with the original manual input of e-commerce product or service information, IoT is more timely, accurate, rich in information sensed by sensing devices, and has high data validity.

- (2) $C = \{c_1, \dots, c_i, \dots, c_s\}$, C is a collection of various network technologies for IoT, including wired network, wireless network, and the integration of wired and wireless network technologies, which together form an information transmission channel to support the transmission of information in each node of the network. c_i , the IoT communication subsystem in the transmission of data, and information through the IoT to reach the established target process, needs to go through various heterogeneous networks through different protocols to achieve reliable information delivery. With the escalation of e-commerce demand for IoT, IoT is required to have anytime and anywhere network coverage and access, information sharing, interaction, and remote operation should reach a higher level. Moreover, the security mechanism and authority management of information also need a higher level of supervision and technical guarantee.
- (3) $AI = \{ai_1, \dots, ai_t\}$, AI includes various artificial intelligence technologies such as cloud computing, fuzzy recognition, deep learning, etc. Through artificial intelligence technologies, data is analyzed, and decisions are made and then handed over to artificial or automatic control devices to achieve intelligent control of business activities and achieve communication between people and things or communication between things and things. The future IoT not only provides services according to people's established goals, but more importantly, it adopts cloud computing and combines the massive data collected by IoT to provide more and broader information services or decision support beyond the scope of human cognition through the model of intelligent learning.

The steps for the implementation of IoT technologies are as follows:

- Step 1: Forming a collection of information M , $M = \{m_1, \dots, m_{s*p}\}$, p is the number of information collected by each terminal, and M is the collection of $s * p$ pieces of information by s IoT sensing terminals.
- Step 2: Transmits information, performs $C(M)$, and transports information from the sensing device to the data server for data analysis.
- Step 3: Intelligent decision-making, executing $AI(M)$, uses algorithms for data analysis and decision-making, and passes the execution results back to the control device for control by transmitting them back to the control device or transmitting the decisions to the Internet for further information management.

2. Technology system of the IoT

IoT technology can be functionally divided into three layers: sensing, network, and application. As shown in Fig. 3.2.

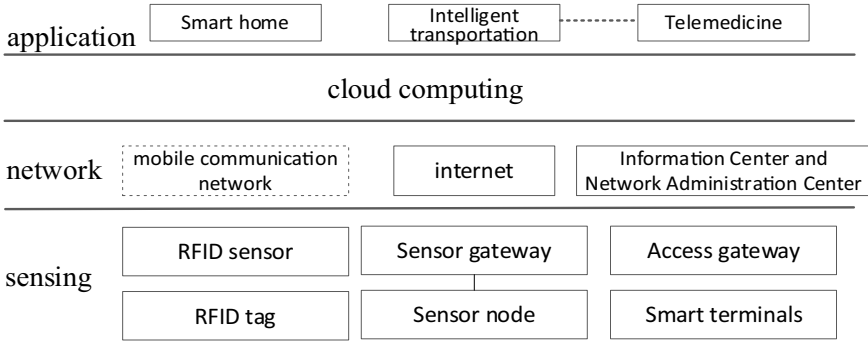


Fig. 3.2 IoT framework

(1) Perception layer—perception and recognition technology

The sensing and identification technology of the Internet of Things is mainly the technology used by each sensing device of the Internet of Things in the sensing and identification of objects, including radio frequency identification technology (RFID technology), GPS positioning technology, infrared sensing technology, sound and visual identification technology, etc. The IoT system initiates information communication through the identified objects and devices, automatically obtains the information of the specified things, and hands the information to the computer processing system in the background for subsequent processing.

Radio frequency identification (RFID) technology is formally defined as: $Rfid^{Tec} = \left\{ \begin{matrix} Rfid^{comm} & d < d^{limit} \\ Rfid^{halt} & d > d^{limit} \end{matrix} \right\}$, Where d^{limit} indicates the effective distance between IoT devices, $Rfid^{comm}$ demonstrates that the two devices in IoT use contactless communication within an effective distance; $Rfid^{halt}$ means the two devices in IoT stop communication when they exceed the effective reach. Radio frequency identification (RFID) technology uses a radio frequency signal and its spatial coupling and transmission characteristics for non-contact, two-way communication to identify stationary or moving objects and data exchange automatically. RFID technology consists of three essential parts: tag, reader, and antenna. And its system data is stored in the radio frequency tag, and each tag has a unique electronic code. The reader comprises a coupling module, transceiver module, control module, and interface module unit, which is used to read/write tag data information. The antenna transmits the radio frequency signal between the tag and the read-write.

Sensor technology is a multidisciplinary intersection of high technology, $sensor^{Tec}$, which is defined formally as: $sensor^{Tec} = \{Bio^{Tec}, Mat^{Tec}, Conn^{Tec}, Ele^{Tec}\}$, in which Bio^{Tec} for biotechnology involved in sensors, such as people’s fingerprints and other biological information; Mat^{Tec} Materials technology involved for sensors, such as material selection for sensors; $Conn^{Tec}$, Communication technologies for sensors, such as sensor information

transfer. Ele^{Tec} represents the sensors involved in electronic technology, such as signal translation, the sensor technology also contains physical technology, chemical technology, etc. Sensor technology combined with wireless network technology integrated sensors with all kinds of technology. Micro-sensors embedded in objects collaborate to achieve information collection and real-time monitoring of the monitoring area, forming a terminal end network that integrates sensing, transmission, and processing. Sensors need to convert the information in the physical world into digital signals that can be processed. The naturally sensed analogue signals need to be amplified by amplifiers and converted into digital signals by analogue/digital converters to be recognized and processed by the IoT.

The sensor consists of a sensitive element, conversion, and other basic circuits. The sensitive feature is the part of the sensor that can directly feel (or respond to) the measured characterization and sense small changes in the object; the conversion element is the part of the sensor that can convert the measured sensitized (or responded to) into an electrical signal; other conversion circuits amplify the electrical signal output and transform it into a recognizable digital signal after shaping, filtering, analogue/digital conversion, etc. Due to sensor technology, the scope of e-commerce transactions has been expanded, such as the consulting services for sports and health provided around smart bracelets.

Relative to radio frequency identification technology, sensor technology has massive room for improvement in energy consumption and other aspects.

(2) Network layer—communication and network technology

The network layer is the basis for IoT information transfer and service support. IoT needs to integrate various wired and wireless communication technologies, networking technologies, etc. to achieve the connection of things to things. Common communication technologies used in IoT are WiFi, Bluetooth, ZigBee, RFID, NFC, etc. Various technologies have different advantages and are used in IoT applications according to their technical characteristics, for example, WiFi technology is more mature and has high bandwidth, Bluetooth technology has flexible networking, RFID costs very little, and ZigBee can do anti-interference in a short distance.

IoT will also use mobile communication technology and satellite communication technology for communication in the network layer.

(3) Application layer—information processing and service technology

The application layer is used to analyze and process the sensed and transmitted information to form control and decisions for intelligent and automated management, applications, and services. Information processing and service technologies are used to address the storage, retrieval, and use of sensed data and to guard against data misuse. They involve various technologies such as mass data storage, search engines, and machine learning. The information processing technology is important for providing services and applications. And it is the key technology that ensure IoT to provide information services. Furthermore, it helps to achieve the fuctions of virtualization, grid computing, service, and intelligence.

3.1.1.2 Blockchain Technology

Blockchain is a chain consisting of multiple blocks in the form of a shared database. The data or information stored in the blockchain has characteristics such as unforgeable, traceable throughout, traceable, open and transparent, and collectively maintained. So blockchain technology is thought to be trustable which can create reliable cooperation and corresponding mechanisms and thus be applied widely.

Blockchain systems $BS^C = (B^C, S^C, T^C)$, B^C, S^C, T^C as sets, respectively, block sets, computer sets, and protocol sets: $B^C = \{B_1^C, B_2^C, \dots, B_m^C\}$, $S^C = \{S_1^C, S_2^C, \dots, S_n^C\}$, $T^C = \{T_1^C, T_2^C, \dots, T_p^C\}$. From a technical perspective, a blockchain system is a series of blocks, distributed across different computers, linked together through a corresponding network protocol, making the information unforgeable and facilitating the initiation of information traceability by consumers.

Blockchain was first proposed by Satoshi Nakamoto in 2008 in his paper “Bitcoin: A Peer-to-Peer Electronic Cash System” and applied to the Bitcoin system to realize Bitcoin district-centric transactions. With the development of blockchain technology, the B^{Tecore} denotes the core set of technologies of blockchain, then $B^{Tecore} = \{B^{Disaccount}, B^{Asyenc}, B^{Connec}, B^{Intcontact}\}$, among them, $B^{Disaccount}$ is distributed ledger technology, which requires the information of blockchain to be recorded and cannot be changed; B^{Asyenc} is asymmetric encryption technology; B^{Connec} is consensus mechanism; and $B^{Intcontact}$ is smart contract.

Relative to the centralized ledger, the distributed ledger is to achieve decentralized management, as shown in Fig. 3.3.

(1) Distributed ledger

In distributed ledger, when a transaction is carried out on the blockchain, the transaction bookkeeping is done jointly by multiple blocks distributed in different places, and each block has a complete account and is involved in monitoring the legitimacy of the transaction with each other and authenticating the transaction information. Distributed ledger technology differs from traditional distributed storage in that distributed ledger technology does not consider data redundancy, each block has complete information, and data consensus is achieved through independent double-entry bookkeeping of transaction information.

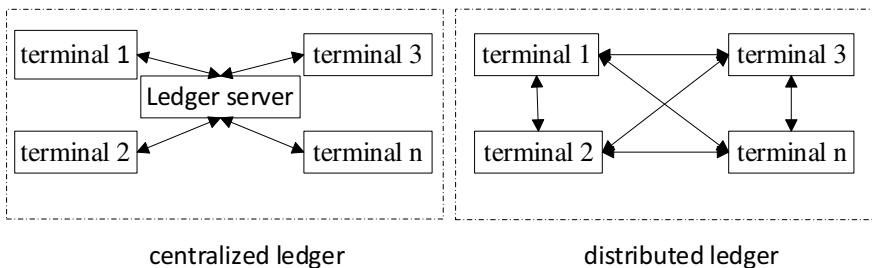


Fig. 3.3 Comparison of centralized and distributed ledgers

(2) Asymmetric encryption

Asymmetric encryption is one of the widely used algorithms in information encryption. Due to the high security of information encryption, it is used in blockchain to secure information transactions, which is the main technology of information security and one of the important elements of cryptography.

(3) Consensus mechanism

The main function of the consensus mechanism is to enable the blockchain to achieve a consistent state in a distributed network. Currently, there are different consensus mechanisms with different levels of balance between efficiency and security. A specific consensus mechanism can be chosen when it meets the needs of the application.

The rule for Proof of Workload (PoW) is formally described as $\text{Bitcoin}(\max(B_i^W(S))) + = 1, i \in (1, \dots, n)$; it represents that, in the blockchain system, the block with the most arithmetic power will be rewarded with the corresponding block-keeping rights and one bitcoin. The PoW mechanism is widely used in the first- and second-generation blockchain systems as well as the first three stages of Ether.

Rule 2 of the proof-of-stake PoS mechanism is described formally as: $P_i = B_i(S) * \text{Time}, \max(B_i^P(S)) \rightarrow \text{Creat}(\text{Block}), P_i - 365 > 0$, else $\text{Bitcoin}(\max(B_i^P(S))) + = 0.05$, that is, in a blockchain system, a node's equity is calculated by the product of the number of bitcoins and the time it has been held (coin age). The node holding the largest equity has the authority to keep the books, and when it finds a new block, the coin age is 0; when the cumulative age of cleared coins reaches 365, the node receives 0.05 bitcoins. The PoS consensus mechanism is widely used after Ether stage 4.

The Proof of Share Authority DPoS mechanism is based on PoS. The holder of Share Authority DPoS can pick a certain number of nodes to authenticate and account for them on their behalf. This is the main difference between Share Authority DPoS and PoS. Its compliance regulation, performance, resource consumption, and fault tolerance are similar to PoS.

Consensus is reached using Byzantine Fault Tolerance (PBFT) in three stages: pre-preparation, preparation, and confirmation, as shown in Fig. 3.4 of the consensus reaching process for 4 nodes using PBFT.

In Fig. 3.4, C denotes the client; 0, 1, 2, and 3 denote the four nodes; 0 is the master node, 1, 2, and 3 are the slave nodes (each node can act as the master node, if the server monitors that the master node is abnormal, it will trigger the view replacement protocol to replace the other nodes with the master node), and 3 is the fault node. The steps of PBFT are as follows:

Step 1: C , the requesting end, sends a request to master node 0.

Step 2: node 0 receives the request from C and broadcasts it, spreading the information to nodes 1, 2, and 3.

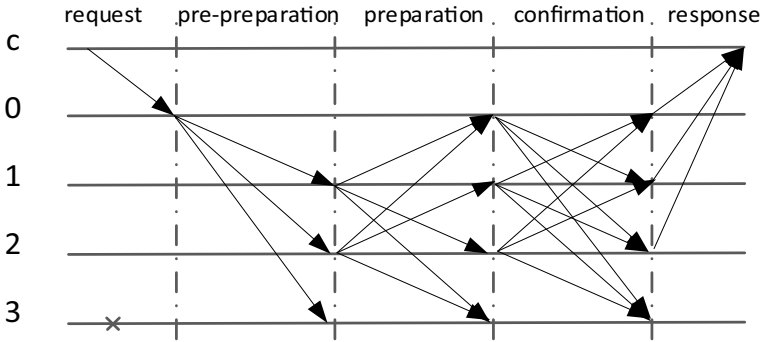


Fig. 3.4 PBFT algorithm forms a consensus process

Step 3: in order to prevent the master node from sending different requests to different slave nodes, nodes 1, 2, and 3 receive and then record and broadcast again to other nodes, $1 \rightarrow 023$, $2 \rightarrow 013$, node 3 being down and unable to broadcast.

Step 4: node 0123 broadcasts an acknowledgment request if it receives more than a certain number ($2n$, where n is the number of Byzantine nodes that can be tolerated) of identical requests during the preparation phase.

Step 5: the 0123 nodes, in the acknowledgment phase, give feedback to C if one of them receives more than a certain number ($2F + 1$) of identical requests.

According to the above steps, PBFT can reach the consensus of the blockchain system in the case of $N \geq 3F + 1$ (N is the total number of computers and F is the total number of computers with problems).

(4) Smart contracts

Smart contracts are based on the premise of trusted and untamperable data and can automate the execution of some pre-defined rules and terms. In the case of insurance, for example, if the information about each individual (including medical information and information about the occurrence of risks) is true and trustworthy, then in some standardized insurance products, automated claims can be implemented through smart contracts.

A smart contract is a set of protocols for automated commitment-based reasoning, where the operation of each contract can be seen as one state to another, using a combination of multiple finite state machines to describe smart contracts, which are defined formally as follows:

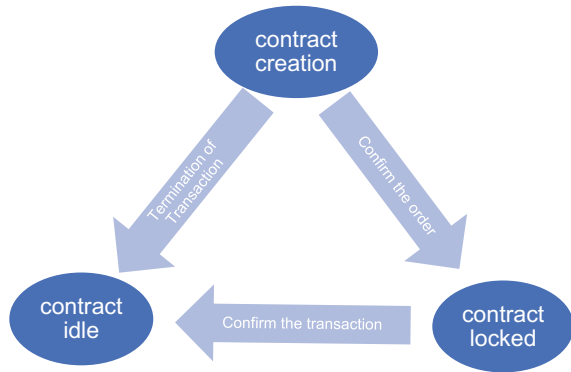
The contract state M^* is a six-tuple,

$$M^* = (Q, A, \sum, \delta^*, s^*, F^*),$$

where

A A is the set of contract actions that generate a timeout action if the action response exceeds its expiry date;

Fig. 3.5 The general state model of a smart contract



Σ is the set of all input events;
 δ^* is the state transfer function, $\delta^*: Q \times \Sigma \rightarrow Q$, the state transfer in the contract is determined jointly by the contract participants.
 s^* is the initial state, $s^* = \{\text{contract created}\}$.
 F^* is the termination state of the contract, $F^* = \{\text{contract idle}\}$.

$$Q = \{q_1^*, q_2^*, \dots, q_m^*\},$$

Q is the set of all contract states,

$$q_i^* \in q_i = (i = 1 \dots m),$$

q_i^* contained in all states of the contract participants.

There are five contract states for the participating contract parties: active, ready, satisfied, expired, and defaulted.

The general state model of a smart contract is shown in Fig. 3.5.

The initial state of a smart contract is contract creation. When a transaction is concluded using a smart contract, the state of the contract will shift from contract creation to contract locked or contract idle, depending on the blockchain transaction.

3.1.2 Network Communication Technologies

Network communication technology is mainly the communication technology between the terminal to the Internet, mainly mobile communication network technology, broadband network communication network technology, WiFi technology, Bluetooth technology, NFC technology, etc.

(i) Mobile communication network technology

Mobile communication, marked by the invention of the first generation of communication technology (1G) in 1986, has gone through five stages of development and is now the main information transmission channel for e-commerce.

- (1) The 1G era, which began in 1986, used analogue signal transmission and supported voice calls, but could not roam globally due to inconsistent national standards.
- (2) The 2G era, which began in 1994 with the adoption of digital modulation technology in communications, saw an increase in communication capacity, support for text message transmission in addition to voice calls, and the widespread adoption of Nokia's GSM standard, but data transmission speeds remained slow.
- (3) The 3G era, which began in 2009 because of the need for picture and video transmission, saw mobile communication technology upgraded to cellular mobile networks for high-speed data transmission.
- (4) 4G era, by the end of 2013 witnesses the improvement of network communication protocols that supports the fast transmission of video and picture transmission of big data.
- (5) The 5G era, which began in 2016, aims to be an intelligent network for business applications and user experience, supporting the interconnection of things with things on the basis of human-computer interconnection, supporting the application of augmented reality and virtual reality, and supporting the construction of a user-centric ecosystem.

(II) Broadband network communication technology

Broadband network technology mainly uses wired networks as transmission channels. With the development of broadband network communication technology, the network is required to provide higher access bandwidth, facilitate large-scale terminal access, and implement more complex information services such as video services on the network. At present, broadband network communication technology is still the mainstream Internet access technology, including 3 aspects, namely: ADSL access, fiber optic access, and VDSL technology.

(ii) WiFi technology

WiFi, as a mobile hotspot, is branded with the trademark of the WiFi Alliance manufacturer as a product certification and is a wireless LAN technology under the IEEE 802.11 standard.

With the release of the latest 802.11 ax standard, WiFi has entered its 6th generation, referred to as WiFi6, and almost all smartphones, tablets, and laptops support WiFi Internet access.

(iii) Bluetooth technology

Bluetooth is a wireless connectivity technology developed by Ericsson for wireless connection between multiple Bluetooth devices. As a short-range communication technology, Bluetooth works within 10 meters in all directions. It offers data confidentiality service most of the time.

(iv) NFC technology

NFC (near-field communication technology) is a fusion of non-contact radio frequency identification (RFID) and interconnection technology, which can identify and exchange data with compatible devices within a short distance (10–20 cm). NFC technology is currently being used in a number of areas. The use of NFC in DCEP (legal digital currency) has not only promoted the use of DECP in places with insufficient network infrastructure, such as Africa, but has also narrowed the communication range to improve payment security.

There are two main modes of operation for NFC: a master card mode equivalent to an IC card using RFID technology; and a point-to-point mode commonly used in short-range data exchange.

3.1.3 Internet and Mobile Internet

(i) The Internet

The Internet is short for Inter-Computer Interaction Network, formerly known as Arpanet, which was put into use in 1969. It is a data communication network that interconnects computer systems and enables network resource sharing and information exchange with functional network software (network communication protocols, network operating systems, etc.), and is defined formally as follows.

Consider the Internet as a five-tuple

$$I = (SI, LI, EI, TI, PI),$$

where,

SI is the set of nodes, $SI = \{si_1, si_2, \dots, si_m\}$, each terminal device connected to the Internet is a node of the Internet, and links can be established between nodes.

LI is the set of links between nodes, $LI = \{li_1, li_2, \dots, li_{m-1}\}$, and the links between nodes are made through the protocols of the Internet.

EI is the set of information on each node on the Internet to carry out e-commerce activities, $EI = \sum (si, li)$, the Internet network nodes between the existence of links, the transmission of various types of information to carry out economic activities.

TI is the set of transmission protocols on the Internet, $TI = \sum TI^i$, $TI^i = (MODE_i, TI_i^{Prot}), (=)$. Where $MODE_i$ for the transmission model of a computer network which is either the OSI model (Open Systems Interconnection Communication Reference Model) or the TCP/IP network model, TI_i^{Prot} ($i = 1 \dots n \dots$) is the protocol in the corresponding network model. With the development of Internet technology, more types of network protocols are applied to Internet communication, such as IPV4, IPV6, etc.

PI is the combination of software systems that support the Internet. Commonly used underlying software systems are Windows, Mac OS and UNIX or Linux, etc. On top of the software systems, there are software systems for various types of applications such as IE or other programs for Internet information interaction.

The Internet has gone through three stages of development: the nascent phase, the rapid development, and the mature phase. In the nascent phase, after Arpanet was put into use, with the involvement of the US National Science Foundation in the Internet in 1983, Arpanet developed and split into two parts as Arpanet and Milnet, with Arpanet focusing on civilian use and Milnet continuing for military use. As the commercial value of the Internet was tapped, the Internet entered a period of rapid development into the 1980s, when it became a channel for communication and correspondence, but was still used primarily for academic and scientific research, along with the creation and development of applications such as the Domain Name System (DNS). In the twenty-first century, light mobile devices (mobile phones, tablet computers, etc.) became popular, and the mobile Internet also developed rapidly.

(ii) Mobile Internet

The convergence and development of mobile communication technology and Internet technology have promoted the application of mobile Internet. Under the mobile Internet, users' mobile phones, pads or other wireless terminal devices access the mobile Internet for information, business, entertainment, and various other network services anytime and anywhere through the mobile network.

The structure of the mobile Internet is shown in Fig. 3.6.

The mobile Internet, due to the use of mobile devices and the support of mobile communication networks, can cover more areas and access more mobile devices than the Internet, providing more convenient services for users with the support of mobile device technology and rapidly promoting the development of e-commerce.

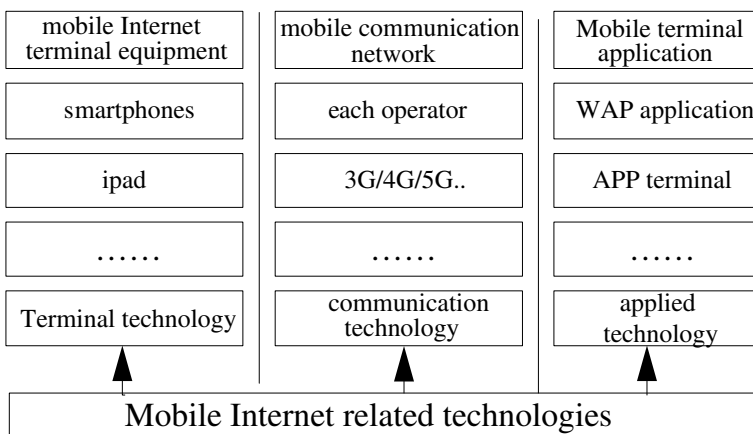


Fig. 3.6 The structure of the mobile Internet

(iii) EDI network

EDI stands for electronic data interchange technology and EDI networks use EDI standards for data exchange. The formal definition of an EDI system is as follows:

$$\text{EDI} = (\text{EDI}^s, \text{EDI}^p, \text{EDI}^h, \text{EDI}^c),$$

where,

EDI^s $\{\text{EDI}_1^s, \text{EDI}_2^s, \dots, \text{EDI}_n^s\}$, EDI^s is a collection of EDI standards, in which e-commerce information transfers are translated and transformed according to EDI standards, which are standards for message encryption, signatures, etc.

EDI^p $\{\text{EDI}_1^p, \text{EDI}_2^p, \dots, \text{EDI}_n^p\}$, EDI^p is a collection of software systems for EDI systems, in which the EDI system initiates the exchange of information or manages the information received in accordance with EDI standards, and whose EDI system integrates a large number of software, such as EDI translation software, EDI conversion software or EDI communication software.

EDI^h $\{\text{EDI}_1^h, \text{EDI}_2^h, \dots, \text{EDI}_n^h\}$, EDI^h is a collection of hardware for EDI systems, a carrier for EDI software systems, and also contains hardware devices that integrate EDI software or standards.

EDI^c $\{\text{EDI}_1^c, \text{EDI}_2^c, \dots, \text{EDI}_n^c\}$, EDI^c is a collection of channels for EDI system communication, such as DDN dedicated lines, broadband networks or mobile networks.

At present, EDI systems are widely used in trade, transport, insurance, banking and customs, and other fields that require high security for information exchange.

3.1.4 The Application of E-Commerce Network Technology

The development of e-commerce network technologies has promoted the development of e-commerce as a new industry. With the development of the digital economy, e-commerce network technology is involved in e-commerce from several aspects, prompting e-commerce to be more effective.

(i) Application of Internet of Things technology in e-commerce

IoT technology is widely used in the management of products or services in e-commerce, where production information is recorded in RFID in a panoramic, real-time manner during the production of goods to regulate and improve product quality in order to reduce the information asymmetry regarding product quality in e-commerce economic activities. In rural e-commerce, IoT technology is used for marketing services such as the production and distribution of agricultural products, and in e-commerce, IoT technology is used for decision-making and services based on information from sensing devices such as smart bracelets.

(ii) Application of blockchain technology in e-commerce

Blockchain technology is widely used in the information management of e-commerce and has solved to a large extent the difficult development problems such as insecurity of e-commerce information, untraceable data, and untrustworthy transactions.

Information in e-commerce transactions can be defined as $E^i = \{E^{gi}, E^{ti}, E^{pi}, E^{li}\}$, $E^{gi}, E^{ti}, E^{pi}, E^{li}$. The collection of commodity information, transaction information, payment information, and logistics information, respectively, $E^{gi} = f(E^{ti}) = g(E^{pi}) = h(E^{li})$, i.e. there is a specific relationship between commodity information, transaction information, payment information, and logistics information, which comes from the information records or authentication of multiple subjects including enterprises, consumers and suppliers, etc. The smart contract and non-codifiable characteristics of blockchain technology guarantee the consistency of information in the e-commerce ecosystem.

With blockchain technology, information in the e-commerce supply chain has trustworthiness. If information about e-commerce transactions at various stages is defined, there exists $f^{(0)}(E^i) = f^{(1)}(E^{i1}) \dots = f^{(n)}(E^{in})$, i.e. the information on the commodity in circulation. The information of the commodity transaction is recorded uncodifiably to any subsequent stage of the commodity transaction so that the information in the supply chain is reciprocal and there is no need to worry about credibility. As a result, it promotes the establishment of mutual cooperation between enterprises, speeds up the processing of supply chain information, and makes the information of the commodity transaction traceable.

The decentralized nature of blockchain technology has developed district-centric transactions in cross-border e-commerce. Defining the supply and demand sides of products in cross-border e-commerce as E^{pov} and E^{cus} , respectively, a path E^{pov} and E^{cus} exists under the effect of blockchain technology, enabling E^{pov} and E^{cus} realizing zone-centric commodity transactions.

(iii) the application of network communication technology in electronic commerce

With the development of network communication technology, e-commerce improves its ability of offering information services. The types of information has expanded from text to text, picture, sound and information. It helps to provide more realistic scenes for commodity transactions of e-commerce.

(iv) The application of Internet technology and mobile Internet technology in e-commerce

The application of Internet technology and mobile Internet technology in e-commerce is not only applied to support remote commodity transactions, but also proximity commodity transactions; participants in e-commerce can realize commodity transactions at fixed locations and also obtain mobile commodity services, such as access to location-based travel advisory information, which promotes the development of O2O e-commerce.

3.2 E-Commerce Terminal Equipment Technology

The terminal equipment technology of e-commerce mainly refers to the technology of the hardware equipment involved in e-commerce transactions, and refers broadly to the technology involved in the equipment terminals of computers, smartphones, wearable devices, and other equipment involved in e-commerce activities, virtual reality technology, and augmented virtual technology.

3.2.1 Computer and Smartphone Terminals

As the earliest Internet terminal device, the computer was one of the most used terminals in the early days of e-commerce. The development of computer technology in computing, storage, and multimedia accelerated the development process of e-commerce. Subsequently, smartphones were used in e-commerce, not only with technologies such as web browsing supported by traditional computer devices, but also with a variety of software installations, combined with GPS and other sensing technologies, to meet more of people's needs in production and life through e-commerce.

Computer systems can be formally defined as: $\text{Comp}^i = (\text{Comp}^{\text{hi}}, \text{Comp}^{\text{si}})$, where Comp^{hi} is the computer hardware system that can be defined as $\text{Comp}^{\text{hi}} = (\text{Comp}_1^{\text{hi}}, \dots, \text{Comp}_j^{\text{hi}}, \dots, \text{Comp}_m^{\text{hi}})$. $\text{Comp}_j^{\text{hi}}$ is the central processor, memory, graphics card, network card and other hardware equipment. Due to the development of distributed processing technology, distributed storage and wireless network card and other technologies, the computer hardware performance has been improved. It can offer more complex computing, more information storage, richer media information display and more convenient network services. Software for computers is divided into system software and application software, depending on the object it serves. When $\text{Comp}^{\text{si}} = (\text{Comp}_1^{\text{si}}, \dots, \text{Comp}_k^{\text{si}}, \dots, \text{Comp}_n^{\text{si}})$, $\text{Comp}_k^{\text{si}}$ is system software, there exists $\text{Comp}_k^{\text{si}} = f(\text{Comp}_j^{\text{hi}})$; when $\text{Comp}_k^{\text{si}}$ is application software, $\text{Comp}_k^{\text{si}}$ is based on system software and serves specific applications, such as browsers for cross-platform information browsing, chat tools to support information, pictures, audio, video, and more information services such as live streaming. The synergistic development of computer software/hardware technology continues to expand the application scenarios of e-commerce and allows more users to participate in e-commerce.

Computers in e-commerce are characterized by poor mobility and high communication network construction costs. At the same time, mobile communication networks are constantly upgraded and mobile terminal device technologies such as mobile phones are rapidly developing. Mobile phones and other mobile device systems are formally defined as $\text{Mes}^i = (\text{Mes}^{\text{hi}}, \text{Mes}^{\text{si}})$, where, for computer hardware systems, $\text{Mes}^{\text{hi}} = (\text{Mes}_1^{\text{hi}}, \dots, \text{Mes}_j^{\text{hi}}, \dots, \text{Mes}_m^{\text{hi}})$, where, Mes_j^{hi} for mobile phone hardware equipment, such as processors, memory, antennas, wireless network cards, and so on. The development of mobile device hardware technology such as mobile

phones facilitates is integrated into mobile phones, such as GPS positioning devices, cameras, sensing devices, etc. It makes them compatible with most of the functions of computers in e-commerce. And $Mes^{si} = (Mes_1^{si}, \dots, Mes_k^{si}, \dots, Mes_n^{si})$, where Mes_k^{si} for the software of mobile phones. Due to the development of mobile software technology, mobile devices such as mobile phones terminals only carry out lightweight information services or data processing, while more information processing is carried out through mobile network to the cloud server. And the integration of mobile software itself. So that mobile devices such as mobile phones support the development of e-commerce with infinitely low cost and a full range of information services. The overall technical architecture model for mobile smart terminals is shown in Fig. 3.7.

In recent years, mobile terminal equipment technology development and participation in e-commerce, mobile intelligent terminal software and hardware technology, and its coordinated development have received attention, mainly involving

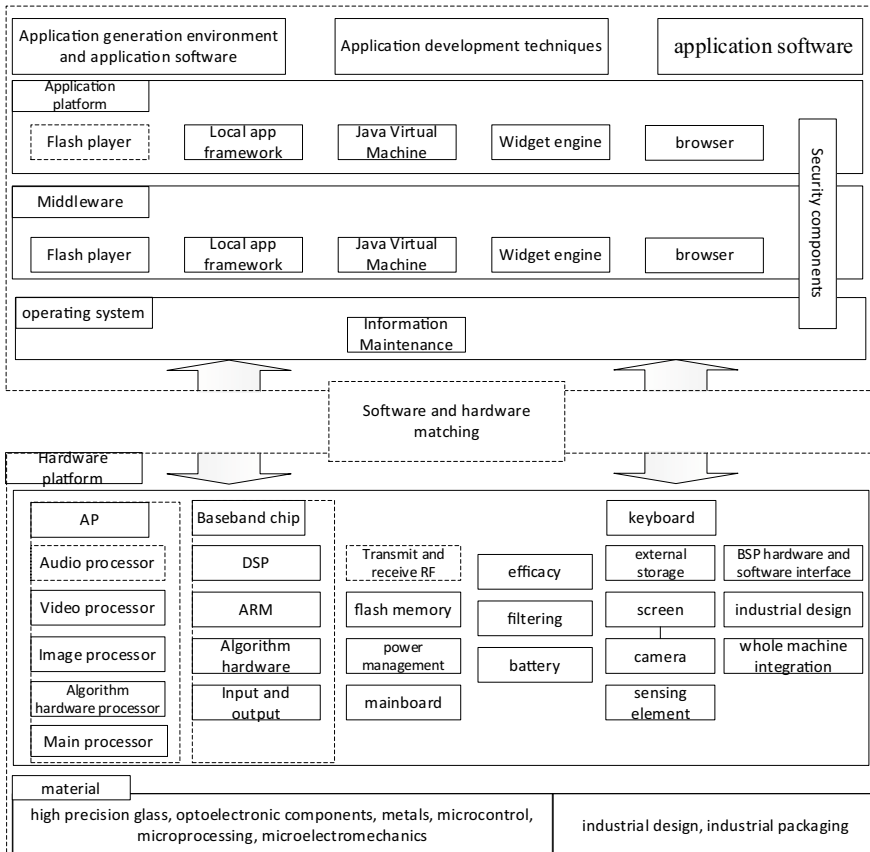


Fig. 3.7 The overall technical architecture model for mobile smart terminals

two aspects: first, to ensure that CPU, GPU, and other mobile device terminal components and peripheral modules are functionally available; second, the software can better adapt to the differentiation capabilities of the hardware, which is ultimately reflected in the application services to provide users with the optimal use experience.

3.2.2 Wearable Devices

Wearable devices (wearable devices) refer to a variety of technologies embedded in electronic devices worn by people through wearable technology to sense, record, analyze, regulate, and intervene in the human body or the surrounding environment with the support of software. Wearable device system is formally defined as the collection of technologies for wearable devices, i.e., the collection of technologies such as sensor technologies, wireless communication technologies, and multimedia technologies. Wearable devices were first defined and applied at MIT’s Media Lab, with early applications mainly in health monitoring in the medical field, and then penetrated into information services in e-commerce, enabling a wider range of information services and more commodity transactions in e-commerce through the automatic collection and automatic sensing of information by wearable devices.

A wearable device is a portable device that is worn on the body or integrated into a wearable object. Wearable devices integrate software to achieve their corresponding functions through data interaction and data communication. With the use of smartphones, wearable devices are now mainly used in areas such as healthcare, sports,



Fig. 3.8 Changes in the wearables market

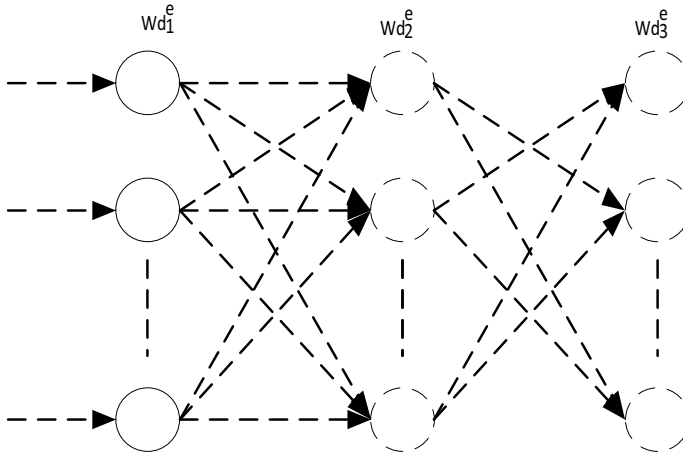


Fig. 3.9 Wearable devices industrial chain network

and education. The global market production of wearable devices has changed in recent years as shown in Fig. 3.8.

The rapid growth of wearable devices has created an industry chain of wearable devices, formally defined as: $Wd^e = (Wd_1^e, Wd_2^e, Wd_3^e), Wd_i^e (i = 1, 2, 3)$. They are the upstream, midstream, and downstream enterprises of the wearable device industry chain. Upstream enterprises are the software and hardware suppliers of wearable devices, including raw materials, components, and software, a market dominated by hardware manufacturers; midstream enterprises are manufacturers of smart wearable devices, such as smart watches, smart bracelets, smart clothing, and other devices; downstream are sales channels, mainly through online and offline terminal sales channels, applied in education and teaching, sports, medicine, and games.

In the industry chain of wearable devices, each enterprise in the industry chain is regarded as a node in the network, and the relationship of each link in the industry chain is shown in Fig. 3.9.

The connotation, architecture, form, and function of wearable devices have been evolving in recent years, compatible with some of the functions of smartphones or, making information acquisition, decision-making, and control of wearable devices more automated and intelligent.

3.2.3 Virtual Reality Technologies

Driven by e-commerce, virtual reality technology VR, augmented reality technology AR, and mixed reality technology MR are also used as end-device technologies to enable digital twins in e-commerce, or to reconstruct virtual worlds under metaverse to enhance the experience of goods or services.

(i) VR, AR, MR, and XR

Virtual Reality (VR for short), is also known as virtual environments, spiritual realms or artificial environments. Virtual technology uses computer technology to generate a scene that is either derived from reality, partly virtual or all virtual, allowing participants to form realistic feelings in terms of vision, hearing, and touch, and to observe, interact or manipulate virtual scenes. The idea of virtual reality was introduced by Ivan Sutherland in 1965 and applied to helmet displays and head and hand trackers in 1968.

Virtual reality integrates several technologies and is defined formally as $T_{vr} = f(T_m, T_s, T_a, T_v, T_c)$, T_m for model building technology, digitizing the real world to form a 3D virtual environment; T_s for spatial tracking technology, determining the user's position and direction in the 3D virtual environment through spatial sensors on interactive devices such as helmet displays and data gloves; T_a for sound tracking technology, using the same source or different sources of sound, with different transmission times in the same medium or different mediums, thus reaching a particular location when the sound has a time difference, phase difference, sound pressure difference, etc., through the calculation of the virtual environment sound tracking; T_v for visual tracking and viewpoint sensing technology, calculate the position and direction of the tracked object; T_c for high-performance computing processing technology, mainly including data conversion and data pre-processing technology, etc. to achieve the calculation in the virtual reality system.

Virtual reality technology applications have four typical characteristics: multi-sensory, immersion, interactivity, and imagination. It is these characteristics of virtual technology that make virtual reality technology widely used in information services such as merchandising and teaching in e-commerce.

The development of virtual reality technology has driven the use of virtual reality technology for the simulation and emulation of real physical world entity information, turning the real world into a virtual world, and enabling the development of augmented reality (AR) technology. Subsequently, the combination of virtual reality technology and augmented reality technology has led to the development of mixed virtual reality technology MR, which creates an interactive relationship between the virtual world and the real world, forming a hybrid world where the virtual and the real interact. Expanded Reality (XR) is a computerized combination of real and virtual, forming a virtual environment that can be interacted with by humans and machines. It combines AR, VR, MR, and other technologies to provide users with a seamless transition between the virtual and real worlds.

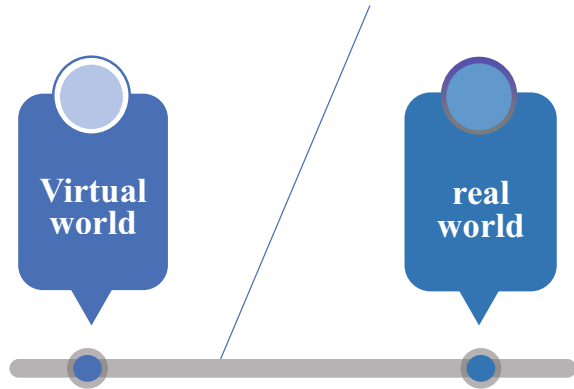
(ii) Digital twin

Digital twin (digital twin) is the use of computer technology to construct identical virtual worlds for the real world and to complete the mapping in virtual space; thus a digital twin is a digital mapping system of one or more important and interdependent equipment systems.

The structural model of the digital twin is shown in Fig. 3.10.

In the digital twin, virtual worlds are built around the real world through a variety of technologies such as virtual reality technology, augmented reality, and mixed reality.

Fig. 3.10 The structural model of the digital twin



The digital twin differs from other virtual technologies, in that the virtual world of the digital twin is a digitization of the real world and is a way of achieving feedback from the physical world to the virtual world; it is mainly used for experiments in industrial manufacturing to achieve the process of transferring successful experiments from the virtual world to the real world and ensuring the adaptability of the technology.

The digital twin is widely used in smart manufacturing and to provide high-quality industrial goods for e-commerce.

(iii) The metaverse

The metaverse is a special kind of virtual world that can be mapped and interacted with the real world, virtualized and created using computer technology. The metaverse incorporates elements of the real world society, therefore, the metaverse virtualizes and digitizes the real world in a process where it provides abstract virtual reality applications based on immersive experiences with extended reality technology, or generates mirrors of the real world based on digital twin technology. Meta-universes are virtual reality systems that are both tightly connected to the external real world and highly independent of parallel spaces, focusing on immersive experiences.

Meta-universe systems are supported by a range of core technologies, which are defined formally as follows:

$Metu = (Metu^{XR}, Metu^{DT}, Metu^{BE})$, where $Metu^{XR}$ is for the extended reality technology that supports the metaverse system, including VR, AR, and MR; $Metu^{DT}$ is for the digital twin technology of the dialogue between virtual and reality in the metaverse system, and for the economic system based on blockchain technology.

The metaverse can replicate or simulate the real world. When users in the metaverse participate in economic activities, they also build the economic system of the virtual world at the same time, therefore, economic activities of the real world in the timeline, simulation of economic operation risks, etc. can be carried out under the metaverse.

The metaverse differs from the digital twin, in that the metaverse is virtual reality, which is directly oriented toward people, emphasizing visual immersion and

displaying rich imagination and immersion. The digital twin is an object-oriented implementation of virtual technology.

3.2.4 Other Sensor Devices

In e-commerce, the transaction subjects involved in e-commerce need to share information. In order to reduce the problem of information asymmetry in the network environment, e-commerce requires higher authenticity and real-time information on commodity transactions, and the acquisition of such information will be carried out through various types of sensor devices:

(i) Camera

The camera is often used as part of a computer or smartphone, but it is also used as a stand-alone device, for example, for the perception of environmental information when developing cloud tourism.

The lens and the image sensor are the two important components of a camera. The scene is projected through the lens (LENS) generating an optical image to the image sensor, which converts the image into an electrical signal, which is then converted to a digital image signal after A/D (analogue/digital) conversion to deliver image information to the network.

(ii) Global Satellite Navigation Systems (GNSS)

Global satellite navigation systems are often integrated into systems such as smartphones, drones or cars to provide information gathering or navigation services for e-commerce information services. Currently, the main global satellite navigation systems are China's BeiDou (BDS), Russia's GLONASS, the United States' Global Positioning System (GPS), and the European Union's Galileo.

The GNSS consists of three components, which are defined formally as: $Gbd = (Gbd^{SP}, Gbd^{FL}, Gbd^{US})$, Gbd^{SP} is the space segment of global satellite navigation. Gbd^{FL} is the ground segment of global satellite navigation. Gbd^{US} is the user segment of global satellite navigation. In the space segment of Beidou, there are a number of navigation satellites, divided into Beidou-1, Beidou-2, and Beidou-3. The existing navigation system is mainly carried out by 35 satellites of Beidou-3, with the last satellite of Beidou-3 to be completed in June 2020; the ground segment of Beidou includes a number of ground stations such as master control stations, time synchronization/injection stations and monitoring stations, as well as inter-satellite link operation and management facilities; the user segment of Beidou mainly includes basic products such as chips, modules, and antennas of Beidou and other compatible satellite navigation systems, as well as terminal equipment, application systems, and application services.

3.3 Server Technology

With the development of computer software and hardware technology, the server is gradually separated from the computer system and is responsible for the complex computing, security, and database management in the computer information system. After the emergence of mobile e-commerce, the server became its main technology in order to support faster and more complex computing, and cloud computing technology became the main form of server.

3.3.1 Cloud Computing Technology

“Cloud computing” is a computing idea proposed by Google, Amazon, and other companies in 2006 to maximize the use of resources for the calculation of large amounts of data under e-commerce applications, and is proposed relative to Turing computing. Cloud is the main form of cloud computing technology and is an application of distributed computing. The National Institute of Standards and Technology (NIST) defines cloud computing as a computing model that uses the Internet to achieve anytime, anywhere, on demand, convenient access to a shared pool of resources (such as computing facilities, storage devices, applications, etc.), i.e. cloud computing is the provision of dynamically traded scalable and virtualized computer software and hardware resources via the Internet.

(i) Turing computing model

Turing computing is the pervasive model of computing that any kind of computing by a computer can be formally defined as: $T_{\text{comp}} = (\Gamma, Q, \delta)$, where, Γ for the input, which is a finite set of symbols/alphabet that can be represented as $\Gamma \supseteq \{0, 1, \blacksquare, \Delta\}$, \blacksquare is an empty symbol, Δ indicates the start of a message. Q is the output message and the output state of the Turing machine with $Q \supseteq \{q_{\text{start}}, q_{\text{halt}}\}$, q_{start} is the start state, and q_{halt} indicates the stop state.

δ called the state transfer function, under the action of δ , $Q \times \Gamma^k \mapsto Q \times \Gamma^{k-1} \times \{L, S, R\}^k$. Where $Q \times \Gamma^k$ denotes the current state, $Q \times \Gamma^{k-1} \times \{L, S, R\}^k$ denotes the computed state.

(ii) Cloud computing model

With the support of a cloud network, computers perform distributed computing to share resources and service computer resources as a unit of service. Under cloud computing, the individual computers on the cloud network are shielded from aspects such as data center management and application deployment, allowing users on the cloud network to quickly request or release resources based on the business load required for the service and pay for the service as needed to maximize the utility of the service to the user.

Based on the network hierarchy that provides the service, cloud computing can be defined as a collection of cloud service models, with SaaS for software and services, PaaS for platforms and services, and IaaS for infrastructure and services.

SaaS model. In the SaaS model, the cost to both the user and the IT company is significantly reduced, but the privacy and security of the user are potentially at risk.

PaaS model. Companies offer various solutions for developing and distributing applications such as virtual servers and operating systems on the web. When using this service, users do not need to care about the runtime environment, the operating system of the virtual machine, etc. eliminating the need for tedious development and maintenance.

IaaS model. To reduce the user's initial hardware investment in the required service, companies provide basic computing, network, and storage resources to consumers on demand via the Internet and deliver these resources on a pay-as-you-go basis. IaaS can be used to build and host web applications, store data, run business logic or perform other things that can be done on a traditional local infrastructure.

The hierarchy of the three models of cloud computing is shown in Fig. 3.11.

The main idea of cloud computing is to service computer resources, and as such, it shields users from issues such as data center management, large-scale data processing, and application deployment. With cloud computing, users can quickly request or release resources according to their business load and pay for the resources used on a pay-as-you-go basis, improving service quality while reducing operation and maintenance costs.

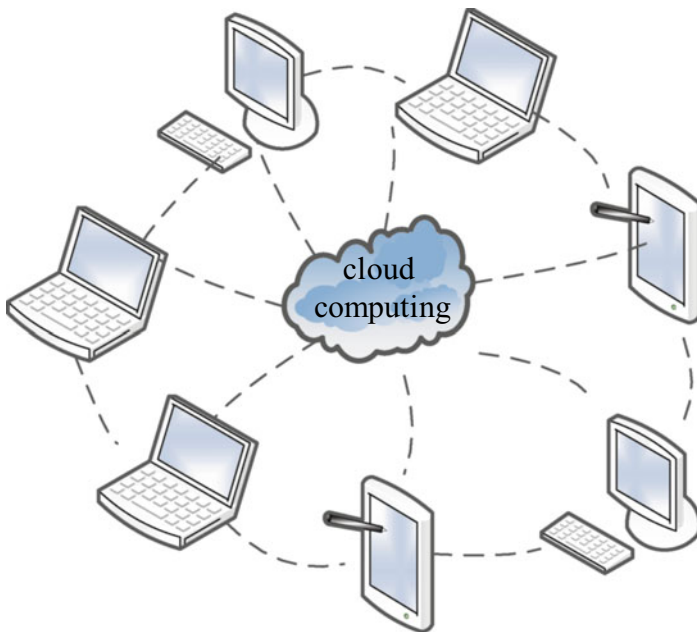


Fig. 3.11 The network structure of cloud computing technology

Table 3.1 Comparison of Turing Computing and Cloud Computing

Items	Turing computing	Cloud computing
Study subjects	Focus on central processing units and operating systems	Focus on interaction between nodes
Type of calculation	Deterministic calculations	Uncertain calculations
Calculation results	Find the optimal solution	The best possible solution
Calculation control method	Unified dispatch	Centralized control
Calculation of execution method	Mechanical execution	Local preferences are dependent on the ability of the subject to act
Computational models	Computable models	Service model
User engagement	People not involved	Someone is involved

There are four deployment models for cloud computing formally defined as $C_{comp} = \{C_{comp}^{pub}, C_{comp}^{pri}, C_{comp}^{comm}, C_{comp}^{Hyb}\}$. C_{comp}^{pub} for the public cloud, at which point the network or third-party service provider provisioning is open to users (paid/free); C_{comp}^{Pri} for private clouds, as a user-owned cloud service, the relevant information and procedures are managed within the organization, the user has more rights and it is easier to achieve service management. C_{comp}^{Comm} for community clouds, where several organizations share cloud infrastructure to support specific community services with common concerns; C_{comp}^{Hyb} provides services for hybrid clouds, combining the advantages of various clouds.

(iii) Turing computing versus cloud computing

Turing computing is the mechanistic processing of information, while cloud computing is based on services. The differences between the two are shown in Table 3.1.

As can be seen, cloud computing is more flexible and better adapted to the needs of big data processing in an e-commerce environment than turing computing.

3.3.2 Cloud Servers

A cloud server (elastic compute service (ECS)) is a computer network that centralizes servers together and allocates and manages resources elastically according to service requests.

The “cloud” of cloud computing is a resource that exists on a cluster of servers on the Internet. Cloud servers virtualize a large number of server clusters into multiple virtual machines (kernel-based virtual machine, KVM), which is the basis of the cloud. When providing information services, cloud servers flexibly allocate and schedule resource pools based on actual resource usage.

The key technologies of cloud servers can be defined as $Ecs = \{Ecs^{Sm}, Ecs^{Com}, Ecs^{Vir}\}$, Ecs^{Sm} is the storage technology for cloud servers, where resources are stored in each server through distributed storage, making the cloud server an integrated super server for the user; Ecs^{Com} is the

resource scheduling technology, where virtual machines can break through the limitations of a single physical machine, with dynamic resource adjustment and allocation, eliminating single points of failure of servers and storage devices; Ecs^{Vir} represents virtualization technology, where server resources are virtualization, including server virtualization, storage virtualization, memory virtualization, network virtualization, etc.

Cloud servers have four main characteristics: resources on demand, i.e. resources are supplied on demand according to user needs, saving costs; efficient and easy deployment, cloud servers provide users with rapid IT deployment and professional guidance; simple and convenient day-to-day management; and low prices and effective cost control.

A number of domestic companies already provide cloud server business, such as Ali Cloud and Baidu Cloud.

3.4 E-Commerce Software Technology

With the development of software technology, the software is divided into front-end and back-end, with the front-end focusing on user interaction and the back-end focusing on data access, storage, and management.

3.4.1 *Software Front-End Technology*

Front-end technology is the software technology that is presented to the user as designed. It is formally defined as the technology applied in the APP and Web site. It helps to get the software supported by different technologies. HTML5-based markup language and JavaScript, Python, and other scripting languages are the main languages used in front-end development. Bootstrap, Vue and jQuery are front-end frameworks used for rapid development of Web applications or APPs. Bootstrap framework allows websites to collapse freely to meet the needs of different device access; Vue framework improves the efficiency of software development as it only focuses on view layer changes; jQuery is a lightweight framework and is the main framework used in APP development. Those are shown in Table 3.2.

Markup languages, layers, scripting languages, and frameworks are the basic front-end technologies, widely used in Sft^{APP} and Sft^{Web}.

3.4.2 *Decision Support Technologies*

Consumers use the front-end of the software to participate in e-commerce, however, consumers are more concerned about the services provided by the software, and the

Table 3.2 Software front-end technologies

Title	Front-end structure and framework	Details
Software front-end technology	Structural layer	HTML5
	Style layers	CSS
	Behavioral layer	JavaScript
		JAVA
Python		
Framework	Bootstrap, Vue, jQuery	

realization of these services is mainly dependent on the decision support technologies at the back-end of the software, i.e. big data technology, artificial intelligence technology, etc.

(i) Big data technology

E-commerce, with the help of various terminal devices, digitizes commodity information and transaction processes, generating a huge amount of data. Due to a large amount of data, diverse forms, etc. e-commerce data cannot be analyzed through mainstream tools for data analysis to help enterprises make decisions, and this kind of data is called big data.

Big data has 5 V characteristics, as shown in Fig. 3.12.

Due to the 5 V characteristics of big data, the key technologies commonly used for big data processing are big data collection technology, big data pre-processing technology, big data storage and management technology, big data analysis and mining technology, and big data visualization and application technology.

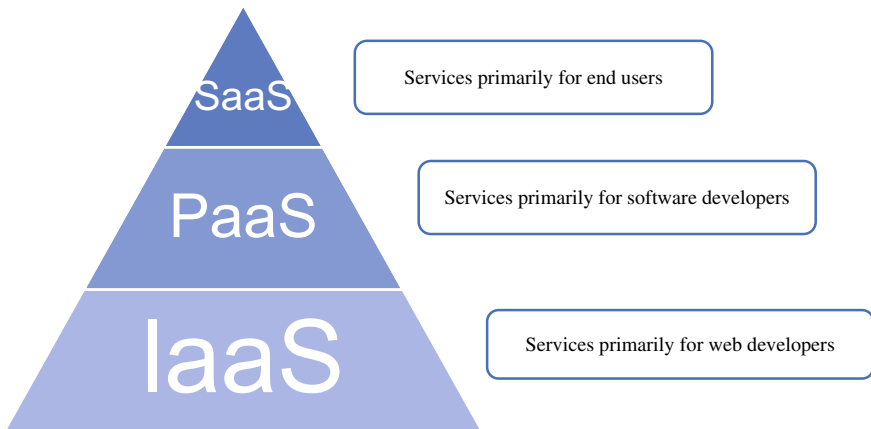


Fig. 3.12 The hierarchy of the three models of cloud computing

The data of commodity transactions under e-commerce can be defined as $Bd^{Ec} = \{Bd^{Ec(1)}, \dots, Bd^{Ec(i)}, \dots, Bd^{Ec(m)}\}$, where $Bd^{Ec(i)}$ for the commodity transaction information of the commodity transaction link of e-commerce when the total amount of the commodity quantity in the e-commerce supply chain remains unchanged; $Bd^{Ec(i)}$ can be written as $Bd^{Ec(i)} = \{Bd^{Eg(i)}, Bd^{Pg(i)}, Bd^{Dg(i)}, \dots\}$, where $Bd^{Pg(i)}$ is commodity information, including commodity price, quantity and other information. $Bd^{Pg(i)}$ are owned by the commodity supplier, while $Bd^{Dg(i)}$ are owned by the commodity demander. If there is a third-party platform, the set of information would contain third-party logistics and third-party payment. With the support of big data technology, if there is inconsistent information in a commodity transaction, the information can be authenticated by multiple parties' data to guarantee the validity of the data.

Business is the most widely used area of big data. With the support of big data technology, the value of data can be further explored, such as the sharing of commodity transaction information in the supply chain among enterprises at each node of the supply chain, which can reduce the risk of enterprise decision-making; big data technology applied to marketing, which can provide users with personalized goods/service customization; big data technology in logistics, which provides better distribution solutions; big data technology in finance, which can develop supply chain finance to reduce enterprise investment and financing risks.

At present, in the application of e-commerce, the problems of big data technology are: firstly, e-commerce involves the field of commerce, big data technology is driven by commerce to pay more attention to its benefits while ignoring the user privacy protection and other aspects of the problem; secondly, big data technology itself needs continuous development and improvement, and the existing big data technology is inefficient; thirdly, the corresponding standards and norms for the application of big data technology are not perfect. In response to the above problems, in order to further promote the application of big data technology in e-commerce, the government or industry needs active policies to protect the application of big data technology, while enterprises need to comply with the corresponding rules and jointly maintain the ecological environment for the application of big data technology in e-commerce.

(ii) Artificial intelligence technology

Artificial intelligence technology is a new technical science that studies and develops theories, methods, technologies, and application systems used to simulate, extend, and expand human intelligence, with the aim of enabling computers to think like people. Artificial intelligence is a branch of computer science that attempts to study the essence of intelligence and produce a new intelligent machine capable of responding in a manner similar to human intelligence, hence the research in this field, such as robotics and expert systems, whose main technologies are machine learning, natural language processing, knowledge management, etc.

Machine learning is one of the core technologies of artificial intelligence technology, which enables data-driven machine decisions in the presence of algorithms that determine the process of machine learning, which is defined formally as $X = \{x_1, x_2, \dots, x_n\}$. Each sample has m attributes and a function mapping needs to be

found from the input space X to the output space Y . The output space Y can best reflect the input space X features. This process of function calculation is the specific process of machine learning, and function mapping is the outcome of machine learning.

Machine learning is divided into supervised and unsupervised learning, depending on whether the data for machine learning is labeled or not. For example, classification learning has a clear objective and is supervised learning; clustering learning has an unclear objective and is unsupervised learning.

Supervised learning is defined as: given a labeled data set $X = \{(x_1, y_1), (x_2, y_2) \dots (x_n, y_n)\}$, need to find a functional mapping model f of input X to output Y that $f : X \rightarrow Y$. The output Y can best reflect the features of the input X . In unsupervised learning, the output Y of classification learning is a discrete set of integers.

To improve the generalization ability of machine learning, the sample data is divided into mutually exclusive training and test sets using the bagging algorithm, and the steps are: generate a dataset D with m samples D' , the probability that a sample is always not picked up is $(1 - \frac{1}{m})^m$, the limits are $\lim_{m \rightarrow \infty} (1 - \frac{1}{m})^m = \frac{1}{e} = 0.368$, to ensure that 36.8% of the samples in D are not in and that these samples will be used for model testing.

Unsupervised learning is defined formally as: taking cluster analysis as an example, given a labeled data set $X = \{x_1, x_2 \dots x_n\}$, using some clustering algorithm to obtain the results of the clusters $= \{C_1, C_2 \dots C_k\}$, C_i is a subset of X ; each set contains at least one element, and each object can belong to only one set, calling the members of C a class satisfying

$$C_1 \cup C_2 \cup \dots \cup C_k = X$$

and $C_i \cap C_j = \phi (i \neq j)$.

Similarly, unsupervised learning can divide the dataset into a test set and a training set, generating machine learning models from the training set and evaluating the models from the test set.

3.5 E-Commerce Security Technology

The smooth conduct of e-commerce transactions is based on a high degree of credit, e-commerce security is the core content of e-commerce and the credit guarantee of e-commerce. In the process of e-commerce transactions, there are many factors that affect e-commerce security, and the formal definition of e-commerce security technology is: $Ese = \{Ese^{Info}, Ese^{Conn}\}$, among others, Ese^{Info} for e-commerce information security, Ese^{Conn} is e-commerce network security technology.

3.5.1 Information Security Technology

The information on e-commerce is divided into three types, such as in Fig. 3.13.

In Fig. 3.14, when the information is R&W, the information can be read and modified, such as the order generation process in an e-commerce platform. When the information is R&NW, the information can only be read and cannot be modified, such as the information consultation in an e-commerce platform. When the information is NR&NW, the information can neither be read nor modified, such as the information on the flow of funds in an e-commerce platform. E-commerce information security is to prevent information security problems of e-commerce according to the established information objectives.

There are generally five types of information security problems in e-commerce: information peeking, information interception, information codification, information repudiation, and information interruption, while different information security problems are prevented using different information security techniques.

Fig. 3.13 Big data has 5 V characteristics

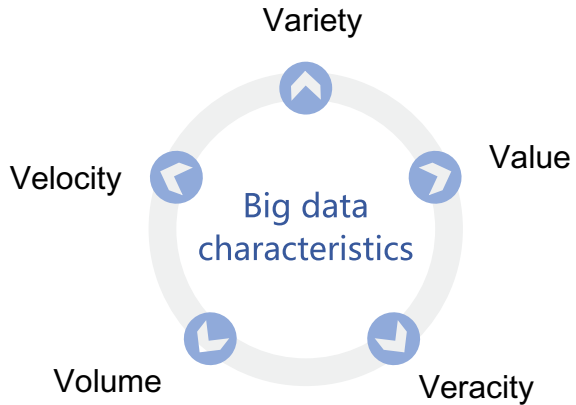
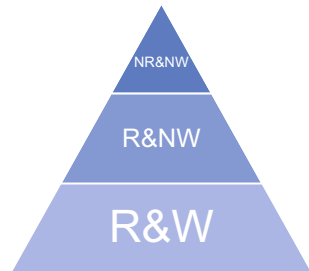


Fig. 3.14 The type of information in e-commerce



(i) Cryptography

Cryptography is the science of studying information encryption and decryption technology and is the foundation of information security. Suppose the information sender is A , the information receiver is B , the information itself is called plaintext, for Mess, the information ciphertext is Mcip, the encryption key is $k1$, the decryption key is $k2$, the encryption function $f(k1)$, the decryption function $g(k2)$, $\exists f(x), A^{\text{Mess}} \xrightarrow{f(x)} A^{\text{Mcip}}, A \rightarrow B$, st. $B^{\text{Mcip}} \xrightarrow{g(y)} B^{\text{Mess}}, A^{\text{Mess}} = B^{\text{Mess}}, A^{\text{Mess}} \xrightarrow{f(x)} A^{\text{Mcip}}$ for the encryption process, $B^{\text{Mcip}} \xrightarrow{g(y)} B^{\text{Mess}}$ for the decryption process. $f(k1)$ and $g(k2)$ are mutually inverse processes, with symmetric encryption when $k1$ and $k2$ are the same, and asymmetric encryption when $k1$ and $k2$ are different.

(1) Symmetric encryption algorithm

DES (data encryption standard) is a symmetric encryption algorithm, the entry parameters of its algorithm are: key k , message Mess, and mode (both key and message are 64-bit, mode is encryption as mode1, decryption as mode2). Take the encryption process as an example (decryption is the inverse process of encryption), its encryption process is as follows:

- Step 1: The message Mess will be the initial replacement IP.
- Step 2: Divide it into two parts, left (L0) and right (R0), each with 32-bits.
- Step 3: Mark the 64-bit key as a check bit and key, respectively, with the 8-bit check bit used to check for errors in the key generation, distribution, and storage process; the 56-bit key is permuted and expanded into 16 48-bit subkeys.
- Step 4: Encrypt the L0 of the key, the process of which is, where K1 combined with R0 is compressed to 32-bits, L0 is bit-operated, and the result is assigned to R1, while R0 is assigned to L1, forming the new 64-bit message L1R1.
- Step 5: Repeat Step 4's operation 15 times to obtain 64-bit information L16R16.
- Step 6: Inverse permutation of the information to obtain DES encrypted ciphertext.

In the above steps, the purpose of IP permutation is to make the Mess out of order, and its permutation rules are carried out with reference to the IP permutation table, as shown in Table 3.3.

Table 3.3 IP replacement table

58	50	42	34	26	18	10	2
60	52	44	36	28	20	12	4
62	54	46	38	30	22	14	6
64	56	48	40	32	24	16	8
57	49	41	33	25	17	9	1
59	51	43	35	27	19	11	3
61	53	45	37	29	21	13	5
63	55	47	39	31	23	15	7

According to the IP replacement table, the information is from 1 to 64-bits, when transforming, the initial information is transformed in a group of 8-bits in order, such as the 58th bit of information is placed in the 1st bit of the replacement table, the 50th bit of information is placed in the 2nd bit of the replacement table, and so on, the 7th bit of information is placed in the last bit of the replacement table. The initial message Mess is: 01010010 01100101 01100011 01110010 01100101 01110100 00100000 01001101, after the initial permutation IP table permutation becomes: 10111111 00101001 10110010 10010111 00000000 01111110 10000000 00001100.

After the IP swap, the X is divided into two parts, the left side is recorded as L0 and the right side is recorded as R0.

$$L0 = 10111111\ 00101001\ 10110010\ 10010111$$

$$R0 = 00000000\ 01111110\ 10000000\ 00001101$$

Put the message into the round robin.

The inverse substitution IP-1 of IP is shown in Table 3.4.

Using Tables 3.3 and 3.4, the round-robin encrypted message is IP-1 permuted to obtain the ciphertext of the message MESS. After the message is passed to the other side, it is decrypted using the inverse process of the DES algorithm.

The DES algorithm uses the same key for encryption and decryption, and is, therefore, called a symmetric encryption algorithm. The DES encryption algorithm is fast compared to the asymmetric encryption algorithm, and as there is only one key for encryption and decryption in DES, its key protection is the key issue.

With the development of information security technology, in order to improve the security of the algorithm, multiple DES algorithms are often used to protect information security. Under the Triple DES algorithm, the information is subjected to three DES operations and the key length is increased to 112 bits or 168 bits. Although the triple DES algorithm improves the security of the algorithm, its execution speed is slow.

Table 3.4 IP-1 replacement table

40	8	48	16	56	24	64	32
39	7	47	15	55	23	63	31
38	6	46	14	54	22	62	30
37	5	45	13	53	21	61	29
36	4	44	12	52	20	60	28
35	3	43	11	51	19	59	27
34	2	42	10	50	18	58	26
33	1	41	9	49	17	57	25

(2) Asymmetric encryption algorithm

The asymmetric encryption algorithm mainly responds to the problem of difficult key keeping in the heap-forming encryption algorithm, proposing that message encryption and decryption are carried out using different keys. In the asymmetric encryption algorithm, its encryption key and decryption key are different, and the sender or receiver of the message can make one of the keys public, the public key is called the public key, and the undisclosed key is called the private key, therefore, the keys of the asymmetric encryption algorithm always appear in pairs. RSA algorithm is an asymmetric encryption algorithm, which is formed by joining the initials of three people who invented the algorithm.

The RSA algorithm is executed in the following steps:

- Step 1: pick any two different large prime numbers p and q and calculate the product.
 $n = p \times q$, $\varphi(n) = (p - 1) \times (q - 1)$.
- Step 2: an arbitrary selection of a large integer $k1$, satisfying that $\gcd(k1, \varphi(n)) = 1$, the integer $k1$ is used as the encryption key ($k1$ and $\varphi(n)$ are prime to each other, i.e. their greatest common divisor $\gcd = 1$).
- Step 3: the determined solution key $k2$, satisfying that $(k1 \times k2) \bmod \varphi(n) = 1$, if $k1$ and are known, $k2$ can be easily computed.
- Step 4: the disclosure of the integers n and $k1$ and the preservation of the secret $k2$.
- Step 5: encrypt the plaintext m ($m < n$ is an integer) into the ciphertext M_{cip} ,
 $M_{cip} = E(\text{Mess}) = \text{Mess}^{k1} \bmod n$.
- Step 6: decrypt the ciphertext M_{cip} into plaintext, and the decryption algorithm is
 $\text{Mess} = D(M_{cip}) = M_{cip}^{k2} \bmod n$

The above algorithm cannot calculate $k2$ based on n and $k1$, therefore, anyone can encrypt the plaintext, but only the authorized user (the user with $k2$) can ciphertext decrypt.

The RSA algorithm is based on a large amount of computation of data, and it is very difficult for a decryptor to find the decryption key in a large amount of space. Furthermore, the RSA algorithm does not require a large cost to protect the key, thus increasing the security of the RSA algorithm.

The symmetric and asymmetric encryption algorithms have their own advantages. The symmetric encryption algorithm is fast and the asymmetric encryption algorithm is slow, but due to the high security, the asymmetric encryption algorithm is often used to protect the key of the symmetric encryption algorithm.

(3) Digital signatures and timestamps

Digital signature is in the process of data transmission, in order to prevent the information from being codified, forged or non-repudiation, the sender A encrypts the data and signature information and transmits them together, and the receiver B decrypts the information after receiving it, if the data in the received information and the data in the signature information are the same, then the data has validity; as shown in Fig. 3.15

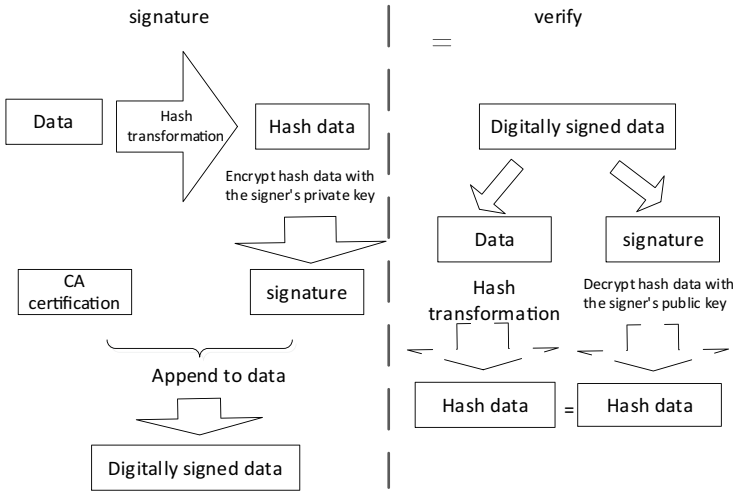


Fig. 3.15 Digital signatures and their verification processes

(4) PKI

PKI (public key infrastructure) is a public key infrastructure, a system or platform that provides public key encryption and digital signature services for the purpose of managing keys and certificates.

PKI mainly includes four parts: certificate in X.509 V3 format (X.509 V3) and certificate revocation list CRL (X.509 V2), CA operation protocol, CA management protocol, and CA policy development.

PKI integrates information encryption and identity authentication in certificates, issues certificates through CA authorities, and adopts certificate revocation list pairs to manage certificates, which is currently the most widely used solution for e-commerce security issues.

(5) Security technology protocol

As PKI for a security issue of the architecture, VISA and other companies to ensure the safe transmission of information, put forward different commercial standards, SSL protocol and SET mechanism are representative protocols in e-commerce and electronic payment, respectively.

The SSL protocol (secure sockets layer) is a network security protocol developed by Netscape, which secures the transmission of data over the Internet by encrypting the data transmitted between web pages and servers. The structure of the SSL protocol is shown in Fig. 3.16.

The SSL protocol sits between the TCP/IP protocol and various application layer protocols, providing security support for data communications. The SSL handshake protocol, built on top of the SSL record protocol, is used for authentication, negotiation of encryption algorithms, and exchange of encryption keys between the two parties before the actual data transmission begins, and to coordinate the state of the client and server so that both parties can synchronize their states.

Fig. 3.16 SSL protocol structure in the TCP/IP protocol stack

shake hands	Encryption parameter modification	Alarm	Application Data (HTTP)
SSL records the protocol layer			
TCP			
IP			

The SET protocol (secure electronic transaction) is an e-commerce security protocol based on credit card online payment, issued by two major credit card companies, VISA and MasterCard, which uses a public key cryptographic system and the X.509 digital certificate standard to guarantee the security of online shopping information.

Under the SET protocol, buyers, sellers, and payment gateways in e-commerce all use the certificate payment information of the certification center for management, and the payment gateway coordinates the payment of funds by the card issuer and the acquiring bank. Under the SET protocol, product order information and payment information are separated and given to the seller and payment gateway respectively, thus effectively guaranteeing the security of the information.

3.5.2 Network Security Technology

E-commerce information in the process of flow and network security are all e-commerce security issues.

(i) Firewall technology

Firewall is located between two networks with different degrees of trust (such as between the internal network of enterprises and the internet) communication, to prevent illegal access and access to important information resources between networks, through the security policy to control data access, in order to protect the system security purposes.

A firewall can be formally defined as

$$Firt = \begin{cases} 1 & \text{Information is checked by firewall policy} \\ 0 & \text{Information does not pass firewall policy detection} \end{cases}$$

When $Firt = 0$, the firewall blocks communication. The policy of a firewall is often whitelisted or blacklisted. When it is whitelisted, only messages allowed through the firewall can communicate, and all other messages are blocked; when it is blacklisted, only messages blocked by the policy are blocked, and other messages are allowed to pass.

There are four types of firewalls in common use: filtering gateway, circuit layer gateway, application layer gateway, and stateful verification. The way they work is as follows:

- (1) Filtering gateway, which is easy to set up but less secure, uses the data in the packet to decide whether to filter or not.
- (2) Circuit layer gateway, which runs at the talk session layer of network communication and requires a change of client to go and communicate with it directly.
- (3) Application layer gateway. Runs at the application layer of network communications and handles any client/server connections established between the internal network and the external network.
- (4) Status verification. Uses pre-configured statements with different parameters to determine whether a message passes or fails by checking whether the information on TCP matches the status within that statement.

Firewalls protect computers from security issues when accessing each other across different networks, such as unauthorized internal access, unauthorized external access, and other attacks from outside the network, but firewalls cannot effectively deal with attacks from inside the network, attacks that bypass the firewall, emerging network threats and viruses.

(ii) VPN technology

VPN (virtual private network), which connects private networks of enterprises in different geographical areas together through a public network, virtually creates a dedicated temporary and stable network channel for communication, i.e. the core of VPN is to use the public network to establish a temporary and secure virtual private network.

To secure communications, tunneling is the basic technology of a VPN, which establishes a data channel (tunnel) over the common network and allows packets to be transmitted through this tunnel, communicating according to the tunneling protocol.

There are three main VPN tunneling protocols, PPTP, L2TP, and IPSec. PPTP (Point-to-Point Tunneling Protocol) is one of Microsoft's earliest protocols, which transmits data quickly but with low security; L2TP is an industry standard Internet tunneling protocol, which is connection-based. The IPSec protocol uses cryptography to secure data in three ways: authentication, integrity checking, and encryption, and works in tunnel mode and transport mode.

3.6 Summary of this Chapter

This chapter provides a comprehensive introduction to the principles of e-commerce in five areas, including: e-commerce network technology, e-commerce terminal equipment technology, server technology, e-commerce software technology, and e-commerce security technology.

This chapter explains in detail the emerging technologies in various aspects of e-commerce: in terms of network technologies, from information collection to information communication, it explains the Internet of Things and blockchain technologies, network communication technologies, Internet and mobile Internet technologies, and specific applications of e-commerce network technologies. The development of terminal technology has made the information of e-commerce more comprehensive and objective; in terms of server technology, cloud computing technology, and cloud servers are mainly explained, and it is the development of server technology that has greatly enhanced the decision-making capability and information service capability of e-commerce; e-commerce software technology, mainly from the front-end software development of e-commerce and the technology required for commerce. Finally, this chapter explains the two main security technologies for e-commerce, including information security and network security.

As e-commerce transactions cannot be conducted without the support of various technologies, a comprehensive grasp of the principles of e-commerce technologies is a must for an in-depth understanding of e-commerce implementation and operation.

3.7 Review Questions for Reflection

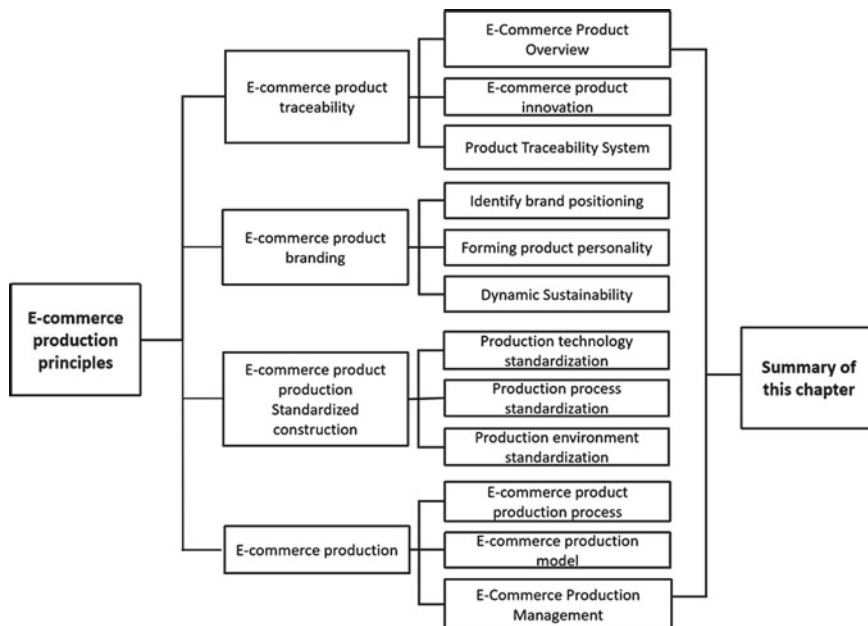
1. Which aspects of e-commerce will be integrated into IoT technology throughout the entire process of manufacturing, circulation, and trading of goods?
2. What are the specific steps for the implementation of IoT technology?
3. What are the ways in which blockchain technology can achieve consensus mechanisms?
4. What is the impact of network communication technology on the development of e-commerce?
5. What are the advantages of mobile Internet over traditional Internet technologies?
6. What is the impact of the development of smartphone terminal technology on e-commerce?
7. What are the differences between the virtual reality technologies VR, AR, MR, and XR?
8. What are the main differences between the cloud computing model and the Turing computing model?
9. Briefly describe the three models of cloud computing.
10. What are the main software front-end technologies and what are the corresponding applications?
11. What is the difference between unsupervised learning and supervised learning in decision support technology?
12. In information security technology, briefly describe the steps in the implementation of the symmetric encryption algorithm DES.
13. What are the types of firewalls in network security technology?

Chapter 4

Principles of E-Commerce Production



Knowledge Map of this Chapter



Introduction to the Case

Jingdong is a self-owned e-commerce company in China, with Jingdong Mall, Jingdong Finance, Paipai, Jingdong Smart, O2O, Overseas Business Units, etc. It was officially granted a virtual operator license in 2013. As the leading e-commerce shopping platform, it sells tens of thousands of brands and 40.2 million kinds of products, including 13 categories of home appliances, cell phones, computers, mother and child clothing, etc.

On January 4, 2017, China UnionPay announced that Jingdong Financial's payment company officially became a member of UnionPay acquirer. Jingdong ranked 139th in the Fortune Global 500 in 2019, and it ranked 59th in the Fortune Global 500 in 2021. The ability to achieve such success is inseparable from a rational operating model that.

1. Focus on user experience

Jingdong's vision is to become the most trusted company in the world, and Jingdong has always had zero tolerance for counterfeit goods. When consumers have a deeper knowledge of genuine licensed goods, Jingdong will fully show its value, and opportunities will come.

When determining whether there is demand at the front end, invest time and energy in communicating with users to capture their needs and user experience. When the user has a demand, Jingdong will consider the benefit pattern to make decisions.

Jingdong believes that only the cooperative suppliers are making money, and only the users who buy things on the platform are getting things at a fair price to stand out among many competitors.

2. Mainly self-operated model

Jingdong used to play the main self-supporting mode, and on the basis of self-supporting, gradually turned to the platform mode, mainly focusing on non-standard categories, such as clothing, etc. to attract more brands, and gradually integrating between these brands and Jingdong logistics service system with the following main features:

- ① Mode: picking and selling mode, i.e. merchants are responsible for supplying and cooperating with operations. Jingdong picking and selling docking operations, Jingdong is responsible for shipping and delivery
- ② Margin: the same as the Jingdong pop store fees, depending on the category, to prevent business violations
- ③ Margin: depending on the premise of ensuring the profit of the merchant, the gross profit rate of about 20%
- ④ Product pricing: merchants only need to provide the supply price, the supply price includes product costs and merchant profits; the selling price

is the supply price plus Jingdong's gross profit, the supply price needs to be reasonable

- ⑤ Distribution: merchants need to arrange their own logistics to distribute the goods to one of the eight warehouses nearest to the location of the products; the transfer is carried out by Jingdong, the cost is borne by the merchant, and the "Transfer Cost Agreement" will be signed; the storage fee and the cost of distribution to consumers are borne by Jingdong
 - ⑥ Inventory: For products with seasonality and shelf life, in the first few months before they are almost out of season or expired, picking and selling will arrange for merchants to participate in some activities that can both sell and promote the products, so that the loss will be minimized or even zero
 - ⑦ Settlement of payment: After the merchant provides the invoice to Jingdong, Jingdong will make payment to the merchant and the gross profit will be deducted directly from the payment. The invoices are all using VAT special invoices
 - ⑧ After-sales: If there is a return due to product quality problems, the merchant will bear the loss, otherwise Jingdong will bear it.
3. Let logistics, property flow, and information flow become the basis of business

Logistics accounts for 70% of user experience. In Jingdong's view, logistics is extremely important to user experience, and Jingdong will continue to implement its channel-sinking strategy to improve its visibility in third and fourth-tier cities and speed up distribution.

B2C logistics system was non-existent in China before Jingdong, and there was an urgent need in the business community, so Jingdong naturally seized the opportunity and started to innovate. Jingdong emphasizes large-scale high-volume procurement from suppliers, then transported to the warehouse, and finally to the hands of consumers. Commodities are only transported once in order to minimize logistics costs.

4. Emphasis on partners to create an industrial chain

Jingdong has reduced the intermediate process and can give cash directly to suppliers without intermediate palletizers, which facilitates the adoption of new systems and low-cost strategies. Jingdong passed the preparation period for cooperation and negotiated with Tencent to finally reach cooperation. After Jingdong boosted its traffic, it brought high growth to itself, while Tencent, as a shareholder, was able to profit for a long time in addition to its support.

Reflections:

1. What are the aspects of e-commerce product innovation? What exactly does it include? And give examples to analyze

2. From the perspective of product traceability, what do you think about the future development direction of e-commerce?

4.1 E-Commerce Product Traceability

4.1.1 Overview of E-Commerce Products

4.1.1.1 Definition and Classification of Traditional Products

A product is everything that people use and consume and that satisfies their needs, which includes tangible services, intangible services, organizations, ideas or a combination of them. Since the 1990s, Philip Kotler and others have proposed a five-level total product concept, arguing that five levels can express the total meaning of a product more deeply and accurately. The total product concept requires marketers to divide customer value into five dimensions when planning market supply. The five basic product concepts are:

- (1) Core product. The core product is the most fundamental use or benefit of the goods offered to the consumer. Basically, every product is used to solve a problem. Therefore, when marketers sell a product to consumers, marketers must be able to reflect the basic utility or benefit of the consumer's core needs.
- (2) Formal products. Formal products are made possible by their core products. Product features include quality, style, characteristics, trademarks, and packaging five elements. Even simple services have similar formal characteristics.
- (3) Desired product. An expected product is a set of attributes and conditions closely related to the product that consumers expect to receive when they purchase the goods.
- (4) Extended products. Extended product is the consumer in the purchase of products and expected products to get all the benefits, including product instructions, quality assurance, installation, maintenance, delivery, technical training, etc. Many Chinese and foreign companies are successful, in part, because they realize the importance of service in the overall product concept.
- (5) Potential products. Potential products are existing products, including all additional products, may develop into the future end product potential state of the product. The term "potential" refers to a product with potential, which indicates the possible evolution of existing products and their prospects (Fig. 4.1).

For the concept of product, the following two types of disciplinary directions are described:

1. The concept of product in the economic sense. Throughout history, the understanding of the concept of product has been a process of continuous development

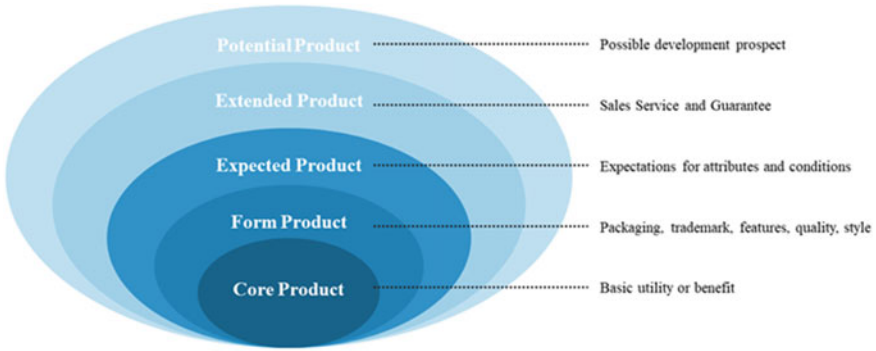


Fig. 4.1 Product five-level structure

and depth. At first, people defined the commodity only from the economic point of view, seeing it as a material, which is designed to meet the needs of people’s material and spiritual life. This is like what Marx said: “A commodity is first of all an external object, a thing that satisfies some human need by its own properties.” In the economic sense, a product should have three characteristics:

- (1) The physicality of the product. The physical nature of the product is the tangible nature of the product. In other words, the product must have a certain material form, and can be perceived by our senses. It must be a tangible material entity.
 - (2) The substance of the product. The substance of a product means that it is different from other products. In other words, the product must have a specific function to meet people’s production or life needs. This function is unique and linked to the entity form in people’s experience. The materiality of the product is also the essential property of the product in the philosophical sense.
 - (3) The utility of the product. The usefulness of the product is the extent to which the specific function of the product meets people’s needs. That is to say, whether the product we buy actually realizes its value. Obviously, the utility of the product is not only the most important feature of the product concept, but also the germ of the product concept in the sense of marketing.
2. The product concept in the sense of marketing. The product concept in the sense of marketing is developed from the product concept in the traditional sense. It inherits the reasonable kernel of the traditional concept of entity, substance, and utility, but greatly expands them, and puts forward the new view that the needs of customers are products. This means that a product is a function or attribute provided by a company that can satisfy the needs of consumers. In this regard, it does not matter whether the product is a material entity or not, the key is to provide some real value to consumers.

If the product concept in the economic sense is the scientific nature of the product, and its value can be measured by objective mathematical statistics, then the product concept in the marketing sense emphasizes the innovation of the product, and the measurement standard is the satisfaction of the subjective needs of consumers. The product concept in the marketing sense has the following characteristics compared with the product concept in the economics sense:

- (1) The usefulness of the product is strengthened. The new concept takes the function or attribute of satisfying consumers' needs as the only criterion to regulate the product. It greatly expands the extension of the product. So that those who can meet the material and spiritual needs of consumption are invariably included in the scope of the product.
- (2) Weakened the physicality of the product. The new concept de-emphasizes the materiality of the product, so that the product has both material tangible and immaterial intangible aspects.
- (3) Revised the materiality of the product. The new concept takes whether consumers are satisfied as the only criterion for evaluating the value of products, thus freeing products from the shackles of both the physical and substantial aspects to a certain extent and embarking on an infinitely broad path of development.

Products in the traditional sense are things that can enter the market as commodities and be provided to the market to meet certain needs of people, and can be divided into two categories: tangible products and intangible products.

Tangible products (P^T for short), also known as form products, are products that can meet the needs of consumers and have a physical (concrete form). Tangible products have materiality and are generally expressed through different aspects such as product packaging P_1^T , product style P_2^T , product brand P_3^T , and product quality level P_4^T .

Then there is

$$P^T = P_1^T, P_2^T, P_3^T, P_4^T \quad (4.1)$$

Intangible products (P^I for short) are mainly service products, which are the result of materializing and dematerializing tangible resources into immaterial forms with value and use value attributes, including digitizable products and information services.

Considering tangible and intangible products as sets P^T and P^I , respectively, these sets contain partially identical elements as well as different elements; enumerating the elements discussed in this book, such as entity existence e and \bar{e} , mode of transmission t , creativity c and \bar{c} , value and use value p , and after-sales services.

Then there are

$$P^T = \{e, t_1, \bar{c}, p, s\} \quad (4.2)$$

$$P^I = \{\bar{e}, t_2, c, p, s\} \quad (4.3)$$

In Eqs. (4.2) and (4.3), physical existence e and \bar{e} are the fundamental differences between tangible and intangible products.

4.1.1.2 Definition and Classification of E-Commerce Products

E-commerce products refer to the goods that are exchanged through computer and communication technology and are divided into tangible e-commerce products, intangible e-commerce products, and digital products.

E-commerce products refer to the commodities exchanged through computer and communication technology and are divided into tangible e-commerce products, intangible e-commerce products, and digital products.

Tangible E-Commerce products (P^{TE} for short) are products obtained by consumers through online browsing, shopping options, and home delivery services, i.e. tangible products obtained through the E-Commerce (EC for short) model, such as clothing, food, etc. purchased online, i.e.

$$P^{TE} = P^T \cap EC \subset P^T \quad (4.4)$$

Intangible E-Commerce products (P^{IE} for short) are e-commerce products including paid consulting services, interactive services, and reservation services that can be delivered to consumers through computer networks, such as intelligence services (legal advice, psychological advice), interactive services (dating and chatting, game playing with) or reservation services (booking airline tickets, hotels) obtained online, i.e.

$$P^{IE} = P^I \cap EC \subset P^I \quad (4.5)$$

Transactions of intangible e-commerce products can be completed entirely through the Internet, so this type of e-commerce belongs to full e-commerce.

Digital products (P^D for short). American economists Shapiro and Van Rijn point out in their book "Information Rules: A Strategic Guide to the Network Economy" that digital products are exchanges encoded as binary streams with characteristics such as replicability, comparability, public goods, and experience products.

Narrowly defined digital products $\llbracket P^D \rrbracket^*$ refer to products and digital format (DF for short) based exchanges transmitted in bit streams over the Internet N , i.e.

$$\llbracket P^D \rrbracket^* = P^I \cap \{N, DF\} \quad (4.6)$$

Digital products in a broad sense include, in addition to digital products in a narrow sense, electronic products based on digital technology or transformed into digital form to disseminate and send and receive through the network, or products

that exist on a certain physical carrier, such as software, information, audio and video products.

4.1.1.3 E-Commerce Product Attributes

Product attributes are the properties inherent in the product itself, a collection of differences (properties different from other products) in various aspects of the product. That is, a product characteristic is a collection of product features that are different from each other. The elements that determine the characteristics of a product include the following aspects, each of which has its own characteristics in its respective field. In each industrial field, the product characteristics play different roles, have different positions, and have different weights in the operation of the product. It is from the interaction of these different characteristics that the goods that appear before the consumer are created.

The determinants of product attributes are divided into the following points:

- (1) Demand factors. Maslow's hierarchy of needs theory holds that human needs are divided into physiological needs, security needs, social needs, social needs, and self-satisfaction needs, rising from material needs to social needs, spiritual needs, and cultural needs. Different products can meet different levels of customer needs. The level of needs determines the integration of the material and spiritual in the function and culture of the product.
- (2) Consumer characteristics. The characteristics of "target consumers" make the individual and collective consciousness of the "group" of people produce different consumer psychology. Different consumer psychology determines different consumer behavior. These different consumers eventually constitute a group of product consumers. Through observation and measurement, it is possible to observe the patterns of group behavior at the macro level, which provides a guide for product and brand promotion.
- (3) Market competition. Industry entry barriers, capital-intensive, technology-intensive, and many other aspects determine the intensity of competition in the industry. Multiple oligopolies may emerge in an industry, but competition is fierce and to some extent chaotic during the growth of this oligopoly. The chaos of competition in the market can be detrimental to the interests of consumers. Therefore, companies must identify the competitive landscape in the market in order to form their own competitive strategies.
- (4) Price bracket. The formation of price depends on the supply and demand and the competitive situation in the market. At the macro level, whether a commodity is a luxury or a necessity also reflects the different levels of consumer demand. The price tier of goods is also determined by the sensitivity and elasticity of consumers to the micro price and the macro price elasticity of the two aspects of the prescriptive
- (5) Channel characteristics. The concentration and characteristics of the channel depend on the demand for the product and the characteristics of the consumer,

and the characteristics of the channel constitute the channel properties of the product. In different channels, there are obvious differences in the price and marketing strategy of the product.

- (6) Social attributes. Just as a person can never be isolated living in a society, the consumption of certain goods is never just a personal consumption. Some commodities that involve the life of the country and its people are very socially significant. The changes in such industries have an impact on all aspects of society. The trust of consumers, the trust of companies, and the trust of governments ultimately determine the confidence in economic revitalization.
- (7) Safety attributes. Some products do not meet the customer's need for security. However, the safety attributes of these products depend on the user's need for safety. Products such as food, cosmetics, housing, and transportation fall into this category. The safety of food has long been developed in mature markets and is becoming more and more refined and strict. It is a care for consumers and a development of the food industry.
- (8) Legal policy. Countries in transition to a market economy have always attached great importance to the legislation of key industries. In the face of the changing policy and legal environment, companies must adjust their products and competitive strategies in a timely manner to deal with policy and legal risks.

4.1.2 E-Commerce Product Innovation

4.1.2.1 Product Innovation Dynamics

“Internet+” drives industrial upgrading and innovation. This will help break through information monopoly and technological barriers, improve the environment for innovation and entrepreneurship, foster new business forms such as cloud computing and big data, and promote continuous adjustment, optimization and upgrading of industrial institutions. The Internet constantly breaks the boundaries of industries, organizations and technologies, integrates various resources such as enterprises, industries and innovators, and then forms cross-industry and multi-disciplinary information innovation platforms. It will help break through information monopoly and technical barriers, optimizing the environment for innovation and entrepreneurship, breeding emerging business forms such as cloud computing and big data, and promoting continuous adjustment, optimization and upgrading of industrial institutions. “Internet+” drives industrial model innovation. Enterprises continue to integrate Internet innovation results in research and development, manufacturing, storage, sales and after-sales service and other links to promote their products, services, management, business and other models from the traditional large-scale intensive to small-scale personalized development. New models for realizing the value of products and services are emerging. “Internet+” promotes management innovation, the development of the Internet and the application of information technology, strengthens the social division of labor, and promotes the organization and

management form of enterprises from the past centralized structure to flat, networked development. The new organizational form is more efficient, more refined, and more intelligent. The combination of “Internet+” and traditional industries ultimately starts with a deep understanding of user experience and discovery of user needs and is value-oriented to meet user needs.

Product innovation is mainly manifested in the following aspects:

- (1) User needs. Product innovation is to better meet user needs. Product innovation focuses on creating and discovering new user needs or user needs that are ignored by the mainstream market, emphasizing on enhancing and better satisfying the known needs of users and taking user value as the guide to help users better accomplish their tasks and achieve their goals in a non-linear way to create value.
- (2) Product experience. Product innovation can bring users a new product experience. The product experience brought by product innovation is new, disruptive, and non-linear beyond the user’s expectation. The product experience brought to users by product innovation has the characteristics of simplicity and non-competition. Simplicity makes the potential target user group of product innovation more extensive and is also conducive to the spread and diffusion of product innovation in the market competition, and at the same time, it is easy to be ignored by the mainstream market competition subjects. Non-competitiveness means that product innovation does not participate in the mainstream target market to compete for users, but seeks survival and development by satisfying non-target users in the mainstream market, which has a certain hidden nature in the early stage of development. Therefore, product innovation does not compete in the mainstream market, but attracts the target users of the mainstream market and forms a new market based on its own value orientation.
- (3) Technology paradigm. Product innovation emphasizes the use of new technological paradigms. In order to obtain the technological breakthrough and progress, the company usually continuously increases the investment in relevant research and development.
- (4) Target market. Product innovation pursues the attention and recognition of the target market. Product innovation is more likely to arise from the needs of non-mainstream markets or non-mainstream target groups that are ignored by mainstream markets, focusing on providing the simplest and most direct products and services to the target markets, which are complex and expensive to provide in mainstream markets. Product innovation is not always recognized by the market, and only product innovation that is accepted by the market has the basis for sustainable development.
- (5) Business model. Product innovation pursues changes to existing business models. Product innovation does not necessarily follow the existing business model, but usually has the quality of breaking the existing business model to create a new business model. Due to the uncertainty of the target users that product innovation mostly targets, enterprises usually require quantitative analysis of the feasibility of product innovation and assessment of the risk of

innovation when allocating resources, so that disruptive product innovation is actually mechanically forced into the existing, highly visible, measurable, and quantifiable market.

- (6) Value creation. Product innovation is a way to optimize each link of the value chain to achieve value creation. If the innovation brings more performance than the user needs, and the user needs to pay extra monetary, energy, and mental costs, it will be difficult to get the user’s attention, and the new market will be replaced by other disruptive innovation products, or with time, the new market will be replaced by other disruptive innovations, or as time goes on, by cheaper and easier-to-use products that squeeze profits.

4.1.2.2 External Product Innovation

An elegant and unique appearance and beautiful packaging can bring a pleasant visual experience to users, which in turn inspires emotional resonance and a pleasant physical and mental experience. This is an important part of improving the product experience and is closely related to the core goal of product innovation. In an ever-changing competitive market environment, an excellent product will first directly enhance users’ visual experience needs through its own unique appearance and packaging. It is also an effective way to stand out from the competition by continuously strengthening the visual experience of users while transmitting the brand connotation and cultural value of the product itself to them. Therefore, the continuous innovation of product appearance and packaging has a very important value proposition to enhance the user’s demand for product experience.

The product extrinsic innovation contains a total of three stages, each of which contains the same several components. In order to unify the discussion of each stage of the product intrinsic innovation, the following assumptions are, therefore, made: in the i th stage, there exists an activation function $F_i^{(1)}$, an error term $\delta_i^{(1)}$ and an influence factor $x_{ij}^{(1)}$, and its weight $\omega_{ij}^{(1)}$, which is finally formed. The result is $A_i^{(1)}$, i.e.

$$A_i^{(1)} = F_i^{(1)} \left(\sum_{j \in \mathbb{J}} [x_{ij}^{(1)} \omega_{ij}^{(1)}] + \delta_i^{(1)} \right) \tag{4.7}$$

In Eq. (4.7), there are j influencing factors in the i th stage, and the influence weight of the influencing factor $x_{ij}^{(1)}$ on the final result $A_i^{(1)}$ is $\omega_{ij}^{(1)}$, in order to improve the accuracy of the formula, so the error term $\delta_i^{(1)}$ is added, and the above mentioned influencing factors are in the process $F_i^{(1)}$, thus forming the stage final result $A_i^{(1)}$. On the basis of this equation, each stage of external product innovation is described in turn.

Product part innovation $F_1^{(1)}$. Therefore, in this phase, companies need to study the composition of the product $x_{11}^{(1)}$ as well as the parts $x_{12}^{(1)}$ through market research, so as to form the new core function of the product B_1 , i.e.

$$A_1^{(1)} = F_1^{(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{1j}^{(1)} x_{1j}^{(1)}] + \delta_1^{(1)} \right) \quad (4.8)$$

Product material innovation $F_2^{(1)}$. Study the product performance $x_{21}^{(1)}$, consumer demand $x_{22}^{(1)}$, cost $x_{23}^{(1)}$, market $x_{24}^{(1)}$, and depict the new material $A_2^{(1)}$ for this product, i.e.

$$A_2^{(1)} = F_2^{(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{2j}^{(1)} x_{2j}^{(1)}] + \delta_2^{(1)} \right) \quad (4.9)$$

Product packaging innovation $F_3^{(1)}$. Study the product usage $x_{31}^{(1)}$, consumer preference $x_{32}^{(1)}$, cost $x_{33}^{(1)}$, market $x_{34}^{(1)}$, and depict the new packaging $A_3^{(1)}$ for this product, i.e.

$$A_3^{(1)} = F_3^{(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{3j}^{(1)} x_{3j}^{(1)}] + \delta_3^{(1)} \right) \quad (4.10)$$

Test promotion stage. Put the initially manufactured product samples into the market, select the internal test users, and collate the feasible modifications by collecting the feedback from the users after using them, and modify and improve the samples, i.e. modify the weights $\omega^{(1)}$ and the error terms $\delta^{(1)}$ of each stage into new weights $\omega^{*(1)}$ and new error terms $\delta^{*(1)}$, i.e.

$$A_1^{*(1)} = F_1^{*(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{1j}^{*(1)} x_{1j}^{*(1)}] + \delta_1^{*(1)} \right) \quad (4.11)$$

$$A_2^{*(1)} = F_2^{*(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{2j}^{*(1)} x_{2j}^{*(1)}] + \delta_2^{*(1)} \right) \quad (4.12)$$

$$A_3^{*(1)} = F_3^{*(1)} \left(\sum_{j \in \mathbb{N}} [\omega_{3j}^{*(1)} x_{3j}^{*(1)}] + \delta_3^{*(1)} \right) \quad (4.13)$$

After the modification stage, the final product $A_4^{(1)}$ is obtained.

4.1.2.3 Intrinsic Product Innovation

Intrinsic product innovation refers to the process of upgrading the existing functions of a product or developing and creating a new product that does not exist in the existing market to meet consumer demand or open up new markets. The founder of value engineering pointed out through his research that the essential difference between different products is the difference in function, and the diversity of product types is the expression of the diversity of product functions. The function is the essence of the

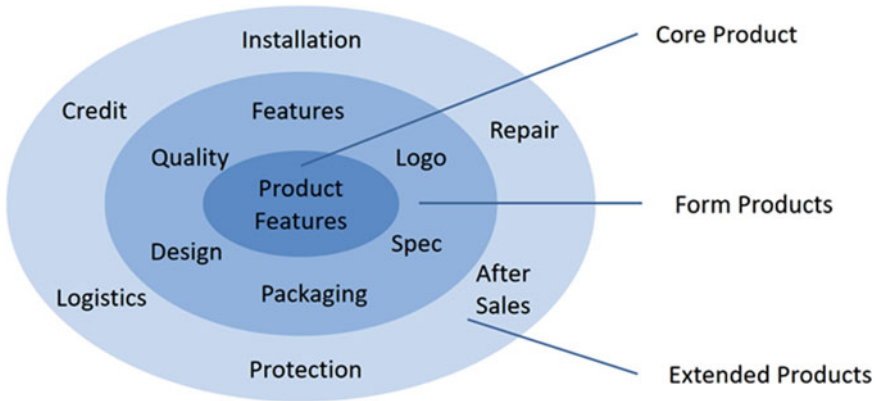


Fig. 4.2 Three levels of product concept

customer’s demand for the product, and the product is the expression of function. In a broad sense, the product concept consists of three levels of content: core products, finished products in form, and extended products, as shown in the figure. Analyzing the diagram, it is easy to find that product function is the most basic and substantial level of the overall product concept, which is the central content of customer demand (Fig. 4.2).

Foreign scholar Prasad has proposed that quality, cost, and reliability are the main factors affecting customers’ purchasing decisions, while scholar Cooper believes that not only quality, cost, and reliability are the three factors affecting the competitiveness of products in the market, but also product function is a key part. After analyzing the factors influencing the success or failure of new product development by domestic and foreign scholars, Wu Peng and others concluded that the key factor that can produce unique customer effects and meet customer needs is the product function. This shows that product functionality has an important influence on the success or failure of new product development.

Although there is a diversity of customer needs for products, fundamentally, what customers need to buy a product is not the product itself, but the function that the product has. Both industry and academia are now inclined to believe that product quality is no longer the main factor affecting product competitiveness in the market, but only the necessary basis for competition, while product functionality is the key factor determining product competitiveness in the market.

Therefore, since the new century, the original contradiction between quality and cost has been gradually converted into a contradiction between performance and cost. Under the condition of ensuring product quality, product function determines the relative competitiveness of the product. In order to unify the discussion of each stage of product intrinsic innovation, the following assumptions are made: in the i th stage, there exists an activation function $F_i^{((2))}$, an error term $\delta_i^{((2))}$ and an influence factor $x_{ij}^{((2))}$ and its weight $\omega_{ij}^{((2))}$, and the final formation of this stage is The result is $A_i^{((2))}$, i.e.

$$A_i^{(2)} = F_i^{(2)} \left(\sum_{j \in \mathbb{N}} \llbracket x_{ij}^{(2)} \omega_{ij}^{(2)} \rrbracket + \delta_i^{(2)} \right) \quad (4.14)$$

In the formula, there are j influencing factors in the i th stage, and the influence weight of the influencing factor $x_{ij}^{(2)}$ on the final result $A_i^{(2)}$ is $\omega_{ij}^{(2)}$, in order to improve the accuracy of the formula, so the error term $\delta_i^{(2)}$ is added, and the above mentioned influencing factors in the process $F_i^{(2)}$, thus forming the final result $A_i^{(2)}$. On the basis of this equation, each stage of extrinsic product innovation is described in turn.

Product concept stage $F_1^{(2)}$. The product exists to meet the needs of consumers, and the product concept stage is to stand in the shoes of consumers and present their innermost concerns and elaborate them in the language of consumers, putting forward a concept clear enough to attract them. Therefore, in this stage, companies need to study the market opportunities of the product x_{11} and the needs of consumers in the market x_{12} through market research, so as to form the product concept A_1 , i.e.

$$A_1^{(2)} = F_1^{(2)} \left(\sum_{j \in \mathbb{N}} \llbracket \omega_{1j}^{(2)} x_{1j}^{(2)} \rrbracket + \delta_1^{(2)} \right) \quad (4.15)$$

Product definition phase $F_2^{(2)}$. The definition of the product is to clarify the use of the product and incorporate the results of the preliminary market research phase, to determine the indicators and characteristics of the product x_{21} , to determine the three levels of the product x_{22} , to determine the consumer interest points x_{23} and the profitability points of the product x_{24} , and to depict the profile A_2 of this product, i.e.

$$A_2^{(2)} = F_2^{(2)} \left(\sum_{j \in \mathbb{N}} \llbracket \omega_{2j}^{(2)} x_{2j}^{(2)} \rrbracket + \delta_2^{(2)} \right) \quad (4.16)$$

The above two phases are the most critical. Although the cost of the product concept and product definition phases is less than 20% of the total project cost, it has 80% of the decision on the success of the whole product. These two phases determine whether the product positioning is clear, whether the customer needs are real, and also determine the size of the implementation risk.

Product design phase $F_3^{(2)}$. The main activities in this phase are the purchase and development of tools and equipment that need to be used in production, as well as the design and manufacture of prototypes for products that have completed the product definition phase, i.e., quantifying and drawing the formed product definition, setting specific indicators related to the product x_{31} , forming designable product functions x_{32} and product models x_{33} , and incorporating them into the development plan A_3 , i.e.

$$A_3^{(2)} = F_3^{(2)} \left(\sum_{j \in \mathbb{N}} \llbracket \omega_{3j}^{(2)} x_{3j}^{(2)} \rrbracket + \delta_3^{(2)} \right) \quad (4.17)$$

Sample development stage $F_4^{(2)}$. Physicalization of the designed drawn product for small-scale sample production, coordination of all resources x_{41} , and use of all technologies x_{42} to design a product sample A_4 that meets objective criteria and has practical value, i.e.

$$A_4^{(2)} = F_4^{(2)} \left(\sum_{j \in \mathbb{N}} [\omega_{4j}^{(2)} x_{4j}^{(2)}] + \delta_4^{(2)} \right) \quad (4.18)$$

Trial promotion stage. Put the initial manufactured product samples into the market, select the internal test users, collect the feedback from the users after use, compile the modification opinions with feasibility, and modify and improve the samples, i.e. modify the weights ω and error terms δ of each stage into new weights ω^* and new error terms δ^* , i.e.

$$A_1^{*(2)} = F_1^{*(2)} \left(\sum_{j \in \mathbb{N}} [\omega_{1j}^{*(2)} x_{1j}^{*(2)}] + \delta_1^{*(2)} \right) \quad (4.19)$$

$$A_2^{*(2)} = F_2^{*(2)} \left(\sum_{j \in \mathbb{N}} [\omega_{2j}^{*(2)} x_{2j}^{*(2)}] + \delta_2^{*(2)} \right) \quad (4.20)$$

$$A_3^{*(2)} = F_3^{*(2)} \left(\sum_{j \in \mathbb{N}} [\omega_{3j}^{*(2)} x_{3j}^{*(2)}] + \delta_3^{*(2)} \right) \quad (4.21)$$

$$A_4^{*(2)} = F_4^{*(2)} \left(\sum_{j \in \mathbb{N}} [\omega_{4j}^{*(2)} x_{4j}^{*(2)}] + \delta_4^{*(2)} \right) \quad (4.22)$$

After the modification phase, the final product $A_5^{(2)}$ is obtained.

Finished product promotion stage. The finished product $A_5^{(2)}$, which has been perfected by modification, is produced on a large scale, and the finished product is put on the market, and the marketer provides relevant information to promote and attract consumers to make purchases, thus achieving the goal of expanding the sales volume of the product.

4.1.3 Product Traceability System

4.1.3.1 Definition of Product Traceability System

In order to strengthen government supervision of pesticide manufacturers and ensure the quality of pesticides, the Ministry of Agriculture promulgated the ‘‘Pesticide Management Regulations’’ and ‘‘Measures for the Management of Pesticide Labels and Instructions’’, which clearly put forward that from January 1, 2018, pesticide manufacturers and pesticide exporters to China must mark ‘‘two-dimensional code’’ on their labels. QR code mark must be unique, each QR code corresponds to the

unique sales packaging unit, to ensure that the production batch, quality inspection, and other information. The tracking query page should have good compatibility and can be browsed on PC and mobile devices. Therefore, the establishment of a traceability system in line with China's national conditions is the current focus of China's pesticide production enterprises to build and invest in the field.

With the rapid development of information technology and the rapid improvement of the national living standard, more consumers will look at e-commerce product safety and high-quality supervision. The application of information technology to the process of e-commerce product supply can be an effective measure to detect the quality of e-commerce products. With the wide application of traceability system, related researches have emerged, such as: framework design of traceability system, research on identification technology, application of big data to traceability system, etc. At present, the mainstream traceability architecture internationally can be divided into four categories: mobile applications, web services, clusters (cloud systems), and HTTP servers. The architecture has been proven to be safe and feasible, and has been widely used in the fields of medicine, food, agricultural and sideline products, industrial manufacturing, etc.

Traceability recognition technology is also a very popular research direction. The traditional electronic label recognition technology is mainly barcode and RFID technology, but with the development of computer technology, the appearance and use of various new technologies, also greatly changed its scope of use. For example, QR code NFC, image recognition, RFID, and EPC improvement, has been widely used in their respective fields.

In addition, the process of production and use of e-commerce products generates big data, and the collection, analysis, and management of these data have become an important research direction for traceability systems. With the widespread application of information systems in various industries, the amount of data generated by the systems has gradually accumulated more and more, and using this accumulated big data to help enterprises make management decisions has become the next research focus of e-commerce enterprises.

The traceability system combined with big data is a qualitative change of the traceability system itself, which has the ability to collect and manage data by itself, and how the system uses these data and transforms them into useful information is the scope of big data. Digging deeper into traceable data and extracting traceability data from its availability will make it have a higher application value.

The traceability system of e-commerce products can monitor the production and supply process of products comprehensively, so as to discover possible safety problems in each production process of products, thus providing a strong guarantee for product safety. For consumers, the traceability system enhances people's confidence in buying safe and secure products. In enterprises, by establishing an e-commerce product traceability system, the trust and confidence of enterprises can be improved, and enterprises using the traceability system will have a greater competitive advantage.

4.1.3.2 Product Traceability System Design

The main role of the e-commerce product traceability system is to trace the goods, and its main form is scanning the QR code. By scanning the QR code, a series of information about the production and distribution of e-commerce goods can be displayed. After the information is displayed, users can check the credit score of the company through this system, and then the credit score is integrated by different users, thus facilitating users to choose whether to buy or not. And if something goes wrong with a product, it is also possible to report the company so that the company’s credit score drops and other consumers cannot purchase poor quality, high-priced goods. Administrators can perform data analysis in the background and record the number of users’ traceability. Consumers can use QR codes for traceability to obtain the above information, which requires merchants to strictly follow delivery rules, which on the other hand guarantees a high quality and efficient system for e-commerce.

The front- and back-end business flow design diagram of the e-commerce product traceability system is shown in Fig. 4.3.

In order to detail the information flow of the e-commerce product traceability system, the following figure shows the traceability process of the e-commerce product traceability system (Fig. 4.4).

In addition to the architecture and platform design mentioned above, new technologies such as blockchain and cloud computing are also introduced into the architecture of the traceability system. For example, blockchain technology is introduced into the product traceability system, and a traceability system structure based on

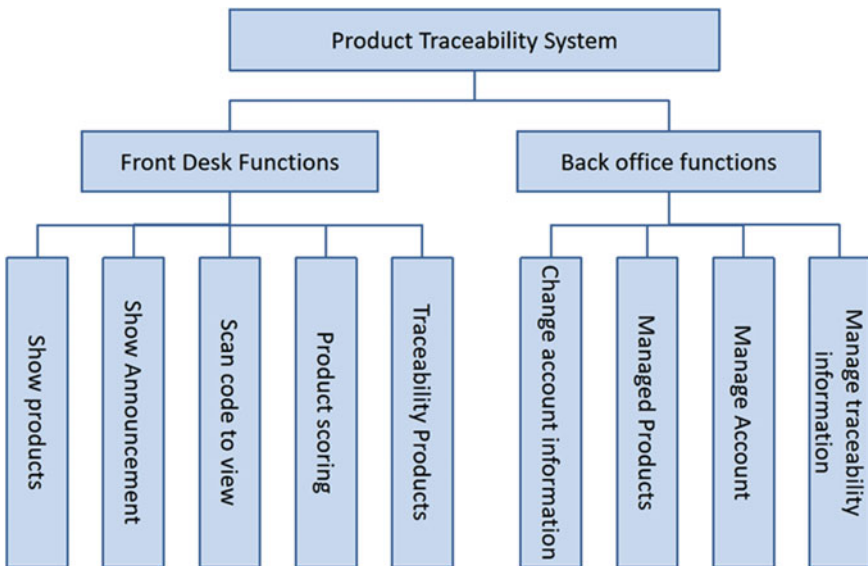


Fig. 4.3 Business flow design diagram of the front and back end of e-commerce product traceability system

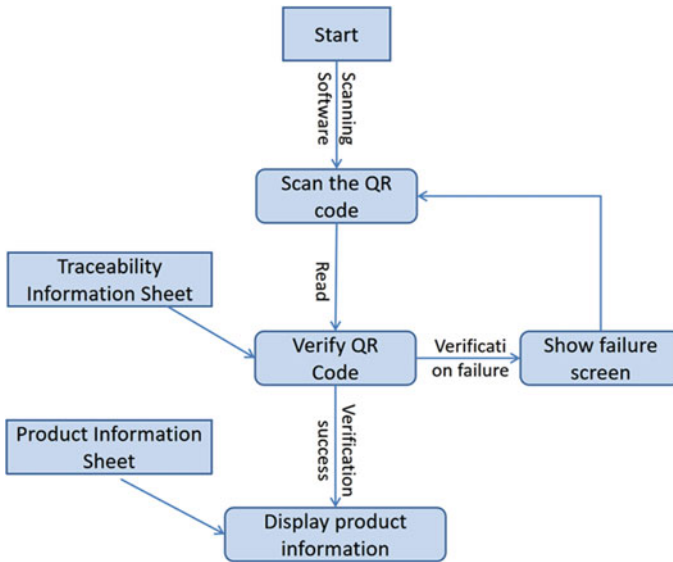


Fig. 4.4 Information flow of e-commerce product traceability system

blockchain is established, thus solving the defects of the traditional single central service platform singular and providing enterprises with a strong and low centralized interactive data and information platform. Or on the basis of the research on existing traceable products, the framework of the traceability system of e-commerce products based on the Internet of Things (IoT) is constructed through IoT technology, information security technology, and cloud computing technology. It effectively understands the specific process and risk status of each link of e-commerce product production, storage, transaction, circulation, and sales, solves the problem of counterfeiting in the production and circulation process and provides an effective basis for e-commerce trade, logistics, and safe consumption. In addition, there is another method of building traceability systems—developing and testing traceability systems through a unified modeling language with full traceability, traceability specification, and rapid database and software customization.

4.1.3.3 Product Traceability System Implementation

The e-commerce product traceability system based on big data discussed in this book is a set of product traceability system established for the e-commerce product industry, mainly for the production, sales, and after-sale services of enterprises. At the same time, on the basis of the well-established traceability system, the products produced by enterprises also provide a transparent supervision path to consumers, who can easily trace the information of product authenticity, production, and logistics through the traceability system, and consumers can also give feedback on their use

through the traceability system. There are four types of users of this system: enterprise managers, product production personnel, sales personnel (including distributors and retailers), and product users. Enterprise managers use the system to manage product production and sales information, and organize and summarize feedback information from product users. Sales personnel use the system for warehouse management and sales management. Product users use the system to inquire about product information, give feedback on usage information and participate in activities launched by the company.

1. System function requirements

The main functional requirements of the agrochemical product traceability system based on big data are: traceability code generation requirements, traceability code collection requirements, traceability code query requirements, and traceability data analysis requirements.

(1) Requirements for traceability code generation

The system adopts QR code as the traceability code for traceability, and the content saved in the traceability code consists of two parts: the URL of the system web terminal and the product code. The user of the traceability code generation module is the enterprise manager, who enters all the production information of the products into the system before the products are produced, and the system generates a unique code for each product according to the production information. After the code is generated, the traceability code is generated by the system, and then it is handed over to the coding equipment to print out the traceability code and combine it with each product.

(2) Traceability code information collection requirements

Through the whole process from production to use, the products' logistics, production, and use feedback information are collected into the traceability system through the medium of traceability codes. The users of the traceability code information collection module include product producers, sales personnel (including distributors and retailers), and product users. After the products are produced, they will be sent to the factory warehouse for temporary storage and scanned into the warehouse, and the enterprise management personnel can know the product reserve quantity in the warehouse instantly based on this information; after the products are produced, they will be sold by distributors and retailers, and their sales process will be carried out by using the code scanning equipment. The system will record the logistics information of the products and the information of the final users according to the operation of the sales personnel.

(3) Traceability information inquiry requirements

After the system collects all traceability data of the products, users can query this traceability information through the traceability system. The users of the traceability information query module include enterprise managers and product users. Enterprise managers can use the traceability system to query the sales of products, check the

sales volume of product brands and models and regional sales volume, and also query the feedback information of product usage to adjust production and sales strategies. Product trailers can use the traceability system to inquire about product authenticity, production information, and logistics information.

(4) Traceability data analysis requirements

The traceability data collected by the system is only the most primitive, and the traceability data analysis module is to classify, process, and analyze these primitive data. For enterprise managers, the most important concern is how the products produced by the enterprise are sold and what kind of trend they show, which are the two major demands of this module: data statistics and data forecast. Data statistics summarizes all sales data and gives sales statistics based on product model, product sales area, sales time, sales personnel, etc. as filtering conditions. Data forecasting is based on statistical results, using the forecasting model to predict the sales volume under various conditions in the future period.

2. System performance requirements

(1) Ease of use

The traceability system should be easy to operate and learn, and users can quickly master the correct use of the system after simple training or reading the user manual. The layout of the operation page is reasonable and should be in line with the operation habits of users. Interactivity is strong, various events are reminded well, and a help interface is set up for users.

(2) Advanced

The system is designed based on web architecture, and big data technology is introduced. The system software and database are deployed in two independent servers, which can ensure that the traceability system software operation and big data storage are independent of each other and run safely. Both the most widely used web system in the Internet era and the cutting-edge big data technology show the advanced nature of this system.

(3) Expandability

With the promotion of the system in the whole production and sales, the number of users and business volume increases, and the huge amount of data and information generated will certainly put forward higher requirements for the system's scalability. The complex functional modules of the system coupled with the gradually increasing volume of business and data make the system scale expand continuously. Therefore, for the expansion and addition of module functions at a later stage, each function of the system must be independent of the other. At the same time, the generation of a large amount of data also requires the system to have sufficient storage space and excellent data processing capability.

(4) Security

The security issue of big data has been a hot spot of domestic research since the emergence of big data technology. The security of the agrochemical product traceability system based on big data is related to the self-interest of enterprises and users, and the private information of enterprises and individuals is uploaded to the traceability system, so the design of a secure system architecture and security protection module is also an important work of this system.

4.2 E-Commerce Product Branding

The concept of brand was first introduced in the mid to late twentieth century by David Ogilvy. Brand in its original etymological manifestation meant to scorch. The concept originally came from Norway, where people distinguished their own property from others through this practice. In the later development process, some craftsmen who were engaged in handicraft production, in order to distinguish their own crafts from those built by others, left their own unique marks on the crafts they built through different forms so that guests could identify them. In the process of continuous development of modern and mature enterprises, the social influence and corporate benefits that an excellent corporate brand can bring are immeasurable. Therefore, each enterprise has started to pay attention to the protection of its own brand and has developed a series of strategic initiatives for brand building, brand promotion, and brand maintenance. Brand is the synthesis of enterprise name, brand personality, and enterprise history and culture, which can improve the anti-stress ability and core competitiveness in the process of enterprise development in the competitive market environment. Philip Kotler, known as the father of marketing, interpreted the concept of the brand from the perspective of the original purpose of brand origin in “Elemental Brand Strategy”, and believed that a brand is composed of elements such as marks, symbols, and name design, and its core element is to ultimately distinguish its own products from those of competitors at the psychological level of consumers.

4.2.1 *Find the Right Product Positioning (Geographical Indication)*

4.2.1.1 E-Commerce Product Positioning

Brand positioning of e-commerce, including market, price, image, geography, population, channels, etc. Brand positioning: “He Luo brand branding method” brand word originated from ancient Norwegian, meaning branding. The deepest brand positioning is what can be shown in the consumer’s psychology, that is, a strong brand.

Consumers have different categories, consumption levels, consumption habits and preferences. Therefore, in the brand positioning of enterprises, enterprises should choose the right target consumers from both subjective and objective aspects. It is necessary to find out different market spaces for different segments and refine them for different customer needs. At the same time, with the development of the times and new products, enterprises can also guide their target customers to new demands, thus establishing new brand positioning. Brand positioning must capture the psychology of consumers and stimulate their needs, which is the key to brand positioning. Therefore, the core of brand positioning is to win the hearts and minds of customers, to bring tangible benefits to customers, and to truly meet their needs.

Product brand positioning methods.

- (1) Market positioning. Market positioning is to analyze the competitors' products in the market and the characteristics of the enterprise's products, to find out the differences between the enterprise and its competitors, to distinguish the competitive advantages and disadvantages, and to avoid shortcomings. In the market, we can create a different feature and image for our company than our competitors, and then pass this image to consumers, find a suitable position in the market, and set up a distinctive flag. Enterprises can position themselves in the market from several angles, not necessarily to do any transformation to the product, but more to build up the image of the enterprise and the product in the mind of consumers, so that the distinctive features of this enterprise can be strictly distinguished from the competitors, so that consumers can obviously feel this difference. The greater the distinction, the more obvious and solid the special position in the consumer's mind. Market positioning can also be a repositioning of existing products or a pre-positioning of upcoming products. The repositioning of existing products, such as adjusting the target consumer group for the product, changing the packaging design to give the product a different meaning, and making the product more suitable for the taste of the target consumer group.
- (2) Brand positioning. The purpose of brand positioning is to transform the influence of the product into a brand in order to guide potential customers' correct understanding. A common feature of all famous brands is to link the functions of the products with the psychological needs of consumers in a consistent image, through which the information of product positioning is accurately conveyed to consumers. To establish a distinctive feature for the brand of the company, to form a sharp contrast with other brands, to show the competitive advantage of the company, and through the brand effect to convey the advantages of the company's products to consumers. In turn, it will find a suitable position in the market and make the brand's products occupy a favorable position in consumers' minds. When consumers have a certain demand, they will immediately think of the brand.

- (3) Comparative positioning. By comparing with competitors or following the industry leader closely, relying on the reputation and prestige of the leader to enhance its own popularity. It is a strategy to establish one's market position by comparing with competing brands, the essence of which is to set off one's brand image with the power of competitors. The selection of reference objects is a key issue in comparative positioning. Generally speaking, only by comparing with a high-profile and well-known brand can you enhance your own value with the help of this force. There are generally two ways of comparative positioning: "second best" and "pan long fu feng". "second best" is the explicit recognition that there is another most prestigious brand in its category, and that it is only second. This strategy will make people have a humble and sincere impression of the company and believe that what the company says is true and reliable, while catering to people's psychology of sympathy for the underdog, and consumers will have a deeper impression of the brand. The "pan long fu feng" means that there are already successful brands in similar products. Although this brand is not aware of it, it can compete with these most popular and trusted brands in a certain area or in a certain aspect.
- (4) Reverse positioning. If the competitor is so strong that it is difficult to compete with it head-on in a short period of time, it can form a distinct deviation from it in a certain segment, forming the concept of "not the same kind". And use the reputation and prestige of the competitor to attract the attention and sympathy of consumers. By taking advantage of consumers' attention and sympathy, the company can gain a place in consumers' minds.
- (5) Positioning in the gap. For any enterprise and product, it is impossible to take advantage of all the advantages, and can not be infallible. If we look carefully, we are bound to find some niche that the big brands do not enter. There are also some market segments that big brands are not willing to get involved in because the capacity of the niche market is not enough to support the return of the big brand's research and development costs and market operations. If small and medium-sized enterprises can find this segment to cultivate, they will definitely be able to occupy a place, and no one can replace them.
- (6) Contrast positioning. Comparative positioning means comparing the company's products with those of competitors or industry leaders, and exaggerating the shortcomings or shortcomings of the other side, so as to enhance the reputation and popularity of the company's products and gain recognition from consumers.

4.2.1.2 E-Commerce Product Positioning Requirements

According to philosophers, every human thought starts from a certain point, and this base point is the first knowledge of things, from which further cognition of the relevant physical objects will be developed later. This is the principle of preconception, but also the nature of human beings themselves. The purpose of product positioning planning depends on making communication and interaction between

the famous brand and customers, and stimulating customers' desire to buy brand products. Therefore, the product positioning plan must follow certain criteria:

- (1) The overall target customer-oriented. Product positioning is an interactive theme activity between the company and the overall target customers, and its focus is whether it can improve the psychological problems of the overall target customers. Therefore, the product positioning plan should be planned for the customer's thought pattern and psychological needs of accepting the information content, to enhance the obstacle of information dissemination, and to station the precise positioning of information content in the customer's heart. Product positioning must be based on the viewpoint of achieving the overall target customer requirements, with a variety of dissemination methods to let the well-known brand in the hearts of customers occupy a beneficial position.
- (2) Diversity is the norm. Competitors are the key element affecting precise positioning, and without the existence of market competition, precise positioning will lose its value. Therefore, no matter which way and countermeasure to carry out product positioning, competitors need to be taken into account from the beginning to the end. Marketing planning staff in the planning of product positioning activities, it is reasonable to select a different product positioning with competitors, production and manufacturing differences, and competitors to facilitate the difference up, and thus beneficial to create a humane corporate image, highlighting the core competitiveness. Differences create a competitive market value, differences create the "first part" of the well-known brand. The diversification of product positioning can not only avoid the easy price war with competitors, but also ensure that the famous brand can become the "first choice" in the mind of the overall target customers.
- (3) The product characteristics as the basic. When planning product positioning programs, the planning company must take into account the quality, characteristics, main uses, and other aspects of the characteristics of the product. Product positioning includes market positioning. This kind of precision positioning comes from the characteristics of the product. Otherwise, this kind of precision positioning loses its support point in terms of chemical substances and becomes groundless. For example, a brand in our country "a little sweet" and its "natural mineral water" precision positioning is from the product's practical characteristics, if the product does not have such characteristics, then this precision positioning will become a laughing stock.

4.2.1.3 The Role of E-Commerce Product Positioning

A geographical indication is a product of a particular geographical origin that has a certain quality or reputation due to its geographical difference. For a mark to be a geographical indication, it must be able to identify its place of origin. In addition, the quality, characteristics, and reputation of the product are fundamentally determined. Because quality depends on geographical location, the product has a strong relationship with its place of origin.

As a collective trademark and regional public brand, geographical indications have objective and scientific judgment standards and guidelines for use. At the same time, government policies, funds and resources support, unified planning of local industry management and promotion mechanism, scientific research and guidance of professional and technical personnel, successful experience of advanced typical enterprises, and a series of industry development methods make geographical indication products continuously optimize and improve product quality, and become high-quality commodities favored by consumers.

A geographical indication is a kind of trademark granted by the government. Its core value is to promote the long-term brand building of products, improve the added value of products, and enable producers to make better profits and consumers to improve product quality, so as to establish a brand image of high recognition, excellent quality, and consumer reassurance in the market and become an important part of the national brand strategy.

An excellent GI is not just a product success, but a region's vertical industry chain, industry research, product production, packaging, logistics, e-commerce, etc. can all be developed in a positive way to form a complete industrial ecology. At the same time, it can also drive ecological tourism, culture, talent introduction, business environment, and the overall development of the point as a line and the line as a surface.

4.2.2 Formation of Product Personality (Brand Identity)

At present, our country is in an era of personalized consumption. "New and unique" products such as creative products, personalized goods, and Netflix products are popping up all the time, and are becoming more and more attractive to young people. However, not every product with personality and creativity will have sales, there will be "pop". Industry insiders said that creativity is not a whim, but the needs of customers for its creation and personality.

In fact, the development of personal creative products is not limited to some shopping sites, but for personalized consumption. How to accurately understand the needs of customers? In recent years, with the rapid development of China's economy, people's living standards are getting higher and higher, their requirements for materials are becoming more and more diversified and personalized, and more and more young people are pursuing individuality and personality. However, not every product with individuality and creativity will have sales and will become "pop".

Personalization and standardization exist at the same time. Since most users of the Internet want to pursue personalization, many of the products sold in integrated network marketing are customized products with personalization at the request of consumers. For those products that do not require a high level of personalization, a high standard of quality should be set when selling online, so that consumers can decide whether to buy without seeing the specific product, but only through the picture description.

For example, audio-visual products or software have high standardization and quality standards, so that consumers can decide whether to buy them through the website's description of their content and functions. If you are ordering flower products on the internet, then you must order according to the specific situation of each person and the specific occasion of use.

With low price advantage. Network market early use of free strategy to attract the majority of consumers, and network marketing saves a lot of sales links. Therefore, the network distributor in the development of network products, the price of more to take a low price policy.

Low-price strategy of network marketing companies should also pay attention to the quality of the products, because consumers for "cheap" products also require "quality".

Brand effect is obvious. Branded Internet marketing includes the name of the product, the product logo, and other identifying information that distinguishes it from other products. When the product's brand is registered, it becomes a trademark and is protected by trademark law to avoid imitation by others. It becomes the key to distinguish a product from other products. The brand concept of a product is a commitment of the company to the consumer, and because of this, the brand of the company is an intangible asset with a certain value, which can be measured in monetary units.

4.2.3 Dynamic Sustainability (Brand Maintenance)

"Brand maintenance means that a company strives to maintain or enhance the value of its brand by maintaining its brand equity as a means to do so. Brand equity, as a resource, can be associated with the brand's logo or name in a certain way, and it can add value to the company or its customers." Based on this, this book considers brand maintenance as a collective term for a series of activities to maintain the brand image and improve the social influence and market position of the brand that arise from the changes in the industry market environment, combined with the current situation of the company's own brand development and the problems that exist.

Brand maintenance is a key part of the brand development strategy. It takes a long historical period for a company's brand to grow and mature from its initial establishment to its ultimate maturity. However, when the brand enters the maturity period, the brand development strategy that enterprises should adopt in this period is the maintenance strategy. Brand maintenance should include three aspects: self-maintenance, legal maintenance, and business maintenance.

Self-maintenance of the brand. The strategic initiatives for self-maintenance of enterprise brands mainly include a series of brand operation activities such as brand trademark design, trademark registration, promotion of brand management philosophy and values, internal management of enterprises, and counterfeit and shoddy

product fighting. Since brand maintenance generally occurs in the middle and late stages of the brand development process, we can define the concept of brand maintenance as the improvement of the enterprise's own system and product optimization, as well as the implementation of anti-counterfeiting and anti-counterfeiting behaviors and brand maintenance initiatives.

Brand management maintenance. After the development of the brand enters the mature stage, the enterprise should not only update and iterate the products constantly through "brand self-maintenance" to improve the brand loyalty of consumers, but also expand the market influence of the brand through "brand operation maintenance". "Brand operation maintenance" mainly includes the stabilization of brand image and brand position in the industry, such as flexibly responding to changes in market environment, meeting the psychological needs of consumers, improving product quality, winning market reputation and maintaining brand image.

Legal maintenance of the brand. From the legal point of view, it mainly includes the protection of the legal rights and interests of the brand owner, the protection of the brand trademark and product patent rights, the legal protection of the place of origin of the brand, the protection of commercial core secrets, and the protection against counterfeit and shoddy products.

4.3 E-Commerce Production

4.3.1 *E-Commerce Product Production Process*

Production model refers to the form and operation of the enterprise's institutional, operational, management, production organization, and technical systems. With the development of science and technology and changes in the state of the degree of marketization, the production model is constantly being upgraded. In general, the development of the production model can be summarized in the following stages, as shown in Fig. 4.5.

4.3.2 *E-Commerce Production Model*

4.3.2.1 **Reverse Production (from Demand)**

The industrial economy is characterized by the mass production and assembly of standardized components in large quantities. The whole production process is mechanical repetitive labor, and the production results are "one to many", using a standard product to meet the needs of different consumers, i.e., the product p_d is copied, and after copying the production process C_1 , the finished product P_d is obtained, i.e.

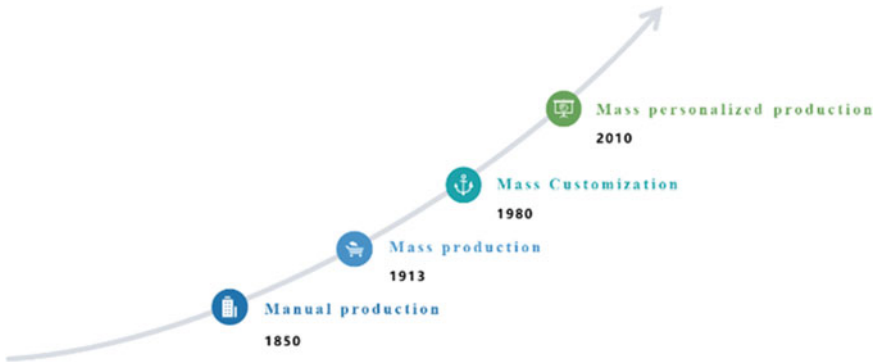


Fig. 4.5 Stages of development of production model

$$Pd = C_1 (pd) \quad (4.23)$$

In the era of e-commerce, the production of standardized products through mass production mode and their promotion and sale through the Internet still belongs to the production-pull type. This approach is likely to lead to supply and demand information mismatch, mismatch between supply and demand quantity, waste of resources, and other problems, as buyers and sellers are unable to maximize the benefits.

4.3.2.2 Personalized Production

In the era of e-commerce, the mass production model is no longer applicable, mass production of standardized products cannot effectively meet the needs of consumers to help enterprises gain profits, according to the specific needs of the production of customized products (Customized Product) to provide customized services has become the new direction. The production mode of enterprises began to shift to mass customization C_2 , based on the formula (4.24), based on the product pd customized according to consumer demand, i.e.

$$pd' = C_2 (pd) \quad (4.24)$$

When the customization process is finished, the resulting custom product pd' is put into the mass production model C_1 of (4.25) for replication production to obtain the finished product Pd' , i.e.

$$Pd' = C_1 (pd') = C_1 (C_2 (pd)) \quad (4.25)$$

The mass customization production model aims to use a range of advanced manufacturing technologies, modern design methods, and management techniques to

achieve product and process reorganization that can provide customized products for users or small-scale markets while having the advantages of low-cost, high-velocity, and high-efficiency mass production. American economist B. Joseph Pine mentioned that the core of mass customization is the dramatic increase in product variety and customization without a corresponding increase in cost; the scope is mass production of customized products; and the advantage is to provide a strategic advantage and economic value.

The mass customization production model based on e-commerce, with the custom enterprise as the core, closely links the custom enterprise, suppliers, consumers, and logistics companies through an e-commerce platform. The custom enterprise organically connects all departments of the enterprise through Intranet, while the customers elaborate their needs to the custom production enterprise through the e-commerce platform, so that the enterprise can make production planning in advance and give feedback to the suppliers; the suppliers provide the custom enterprise with the required raw materials and parts in time to meet the production needs based on the information; the logistics company quickly and accurately delivers the raw materials and parts from the supplier to the customized enterprise, and delivers the customized products to the customer after the production is completed.

4.3.2.3 Customized Production

Since the twenty-first century, the significant improvement in economic level has given rise to some highly personalized and diversified consumer demands, especially in some special consumer fields such as medical and health devices, accessories and smart wearable products, etc. Consumers are completely unique and have extremely high requirements for personalized products, and the existing mass customization production methods cannot fully meet this demand. Therefore, there is an urgent need for a production model that is compatible with the highly personalized needs of customers and can maintain high efficiency and low cost, which is Mass Personalized Production (MPP), mainly based on a one-to-one interaction with customers to stimulate their potential demand for products, and assisted design by professionals to provide customers. This is Mass Personalized Production, which is based on a one-to-one interaction with customers to stimulate their potential demand for products and is designed by professionals to provide customers with “personalized products” and positive service experiences to meet their individual needs. If such personalized demand function is defined as C_3 , then the demand function of the i th customer is C_{3i} , and the customized product pd_i received by this customer is

$$pd_i = C_{3i} (pd) \quad (4.26)$$

The resulting customized product pd_i is put into the mass production model C_1 to obtain the finished product Pd_i , which is

$$Pd_i = C_1 (pd_i) = C_1 (C_{3i} (pd)) \quad (4.27)$$

4.3.3 E-Commerce Production Management

4.3.3.1 Production Management Module

In the production process of e-commerce products, in order to provide a high level of quality customer service while achieving low product inventory and high production efficiency, enterprises usually have to adopt a more reasonable production management, and this continuous optimization process is generally divided into three stages information-based production management, digital production management, and intelligent production management. These three stages are not a complete progressive development relationship. With the development of artificial intelligence technology and intelligent sensing technology, enterprises in the new stage can overcome the previous technical problems, so as to achieve the full call of resources and improve the production efficiency of products.

Informatization production management. Informatization resources are the root of informatization production management. Production process informatization includes CNC technology, flexible manufacturing system, distributed digital control, additive manufacturing technology, manufacturing execution system, etc. By using modern information technology, enterprises can fully obtain all kinds of information in the market, industry and production process, dig deeply the value of information, quickly respond to the market, and realize informationized production management.

Digital production management. Digital production is the integration of all kinds of information digital technology into the actual manufacturing technology of the industry. Based on user needs, enterprises use big data, cloud computing, virtual reality and other supporting technologies to realize the rapid collection, analysis, planning and reorganization of resource information, so as to complete the design, development and manufacturing of various products, and quickly produce products that meet user needs.

Intelligent production management. Intelligence is a comprehensive upgrade based on information technology and digitalization, an attribute to meet consumer needs with the support of the Internet, computer networks, big data, and intelligent technology, and an inevitable trend in the development of human civilization. Intelligent production is the full use of a variety of modern intelligent technologies in the manufacturing process to achieve the automation of enterprise production and management, standardize enterprise production management, reduce the probability of random errors in production, fill various process loopholes, improve production efficiency, and other purposes.

Considering the influence of three endogenous factors, namely production laborers M_1 , production technology and equipment M_2 , and the degree of intelligent management M_3 , on the decision adjustment in the production process of the enterprise, suppose there exists a multivariate function $G(M_1, M_2, M_3)$, which has any order derivative in some neighborhood of the point $M^{(0)}, (M_1^{(0)}, M_2^{(0)}, M_3^{(0)})$

then the matrix form of the Taylor expansion of the multivariate function $G(M_1, M_2, M_3)$ at the point $M^{(0)}$ is

$$G(M_1, M_2, M_3) = G(M^{(0)}) + \nabla [G(M^{(0)})]^T \Delta M + 1/2 \Delta M^T G(M^{(0)}) \Delta M + \dots \tag{4.28}$$

Among them:

$$(1) \Delta M = [\Delta M_1 @ \Delta M_2 @ \Delta M_3], \Delta M_1 = M_1 - M_1^{(0)}, \Delta M_2 = M_2 - M_2^{(0)}, \Delta M_3 = M_3 - M_3^{(0)}.$$

$$(2) G(M^{(0)}) = [\nabla^2 G / (\partial M_1^2) \& (\partial^2 G) / (\partial M_1 \partial M_2) \& (\partial^2 G) / (\partial M_1 \partial M_3) @ (\partial^2 G) / (\partial M_2 \partial M_1) \& (\partial^2 G) / (\partial M_2^2) \& (\partial^2 G) / (\partial M_2 \partial M_3) @ (\partial^2 G) / (\partial M_3 \partial M_1) \& (\partial^2 G) / (\partial M_3 \partial M_2) \& (\partial^2 G) / (\partial M_3^2)],$$

是 $G(M)$ 在 $M^{(0)}$ 点处的海塞矩阵.

$$(3) G(M^{(0)}) = [\nabla^2 G / (\partial M_1^2) \& (\partial^2 G) / (\partial M_1 \partial M_2) \& (\partial^2 G) / (\partial M_1 \partial M_3) @ (\partial^2 G) / (\partial M_2 \partial M_1) \& (\partial^2 G) / (\partial M_2^2) \& (\partial^2 G) / (\partial M_2 \partial M_3) @ (\partial^2 G) / (\partial M_3 \partial M_1) \& (\partial^2 G) / (\partial M_3 \partial M_2) \& (\partial^2 G) / (\partial M_3^2)],$$

is the Hessian matrix of $G(M)$ at the point $M^{(0)}$.

Theorem for determining the extreme value of a multivariate function according to the Hesse matrix, i.e. let the multivariate function $G(M_1, M_2, M_3)$ have second-order partial derivatives in the neighborhood of the point $M^{(0)}$ if $\partial G / (\partial M_i) = 0, I = 1, 2, 3$, and according to its Hesse matrix positive characterization, the firm can make the optimal decision in accordance with itself, i.e.

When the enterprise's Hessian matrix $G(M^{(0)})$ is a positive definite matrix, $G(M_1, M_2, M_3)$ at the point $M^{(0)} (M_1^{(0)}, M_2^{(0)}, M_3^{(0)})$ can take the very small value, the enterprise should adjust the policy at this time to improve the efficiency of production management.

When the enterprise's Hessian matrix $G(M^{(0)})$ is a negative definite matrix, $G(M_1, M_2, M_3)$ can take a great value at the point $M^{(0)} (M_1^{(0)}, M_2^{(0)}, M_3^{(0)})$, the enterprise should keep the current state at this time and continue to maximize the efficiency of production management.

When the enterprise's Hessian matrix $G(M^{(0)})$ is an indefinite matrix, $G(M_1, M_2, M_3)$ cannot reach the extreme value at the point $M^{(0)} (M_1^{(0)}, M_2^{(0)}, M_3^{(0)})$, the enterprise's current policy is not the optimal policy and should be adjusted and optimized.

When the enterprise's Hessian matrix $G(M^{(0)})$ is a semi-positive or semi-negative matrix, $G(M_1, M_2, M_3)$ may take extreme values at the points $M^{(0)} (M_1^{(0)}, M_2^{(0)}, M_3^{(0)})$, and the enterprise should take other ways to measure the current situation.

4.3.3.2 Production Management System

The production management system of the enterprise is a comprehensive management platform that integrates MES, ERP, WMS, TMS, and various intelligent hardware devices using the latest IoT, cloud computing, and artificial intelligence technologies, so as to realize the production management, operation scheduling, quality inspection and traceability, operation and maintenance monitoring of the factory and create a digital, automated and intelligent modern factory. Ultimately, the effect of reducing energy consumption, increasing production efficiency, ensuring production quality, and improving enterprise management is achieved.

An enterprise's production management system consists of four components.

Equipment interconnection. Enterprises through the Internet of Things, sensors, PLC controller, acquisition terminal and other technologies, docking the factory's steel processing machine, cutting machine, molding machine, driving machine and other processing equipment, real-time monitoring of equipment conditions, to achieve the linkage between equipment and system. The significance of realizing the interconnection between various equipment tools and machines is described from two aspects.

From the company level, virtual software is important. In the assembly line, machinery and equipment produced by various manufacturers have to cooperate with each other. Before the product enters the manufacturing company, a digital model of all the equipment to be controlled must be created to simulate the actual application and virtualize the software. Based on this, it is possible to make all the connections between computers and devices, intelligent connections, that is, an architecture defined by software.

At the business model level, companies need to ensure that all devices can be involved, that any type of process can be implemented, and that such technologies need to be complex and robust at the bottom, but have a lot of flexibility at the top, and be simple to use.

Production Management. Enterprises use barcode, QR code, FRID chip and other items commonly used identification technology to automatically collect and record the production process information, control the production process, control the pace of production.

Intelligent report. Smart report global control automatically generates reports and supports data export, which is easy for managers to control the overall situation. The information recorded on the production report includes quantity, category, date, etc. In production management, the establishment of a complete product report can help managers track batch numbers and discover change points, corresponding to quality complaints and provide reference for the business decision of enterprises.

Stockyard management. Yard stacking management is the storage management by the yard department when unloading and unloading the goods. The visualized storage yard can update the data of storage yard in real time and dynamically manage the



Fig. 4.6 Workflow of production management system

incoming and outgoing components. The workflow of the production management system of the enterprise is shown in Fig. 4.6.

4.4 Standardization of E-Commerce Product Production

Standardization of e-commerce product production is the standardization activities carried out for the object of the production stage of the e-commerce industry. The standard is based on new applicable scientific and technological achievements and advanced production experience of e-commerce products, approved by the corresponding competent ministry, specific forms of release of the environmental conditions of the origin of e-commerce, production inputs, product quality, production equipment, premises, etc. to make uniform provisions of the guidelines and basis. The standardized production of e-commerce products refers to the standardization of production in strict accordance with the production link (revised), the e-commerce production link into the standardized production procedures and management track, the essence is to break the current bottleneck in the implementation of standardized production of e-commerce products and mechanism innovation. Based on the law and internal mechanism of promoting the standardization of e-commerce, this program in-depth studies the standardization demand of consumers and its internal action, and attaches importance to the supply and demand of standardized technology, service and policy. In addition, this scheme attaches importance to the information feedback of participants in the implementation process of standardized production of e-commerce products, which can adapt to the needs of enterprises and enhance the dominant position of enterprises.

4.4.1 Standardization of Production Technology

The standardized production of e-commerce production is an inherent requirement for improving the efficiency of industrial operation and the added value of products, and is also an important way to guarantee a balanced supply in the e-commerce market and improve the level of product quality and safety. From the technical

paradigm level, the standardized production level of e-commerce production is mainly manifested in the following aspects:

The first is the adjustment of production factors in the input chain, i.e. the substitution of advanced factors such as capital and technology for traditional factors such as stop land and labor, which brings about savings in product costs and improved production efficiency.

The second is the harmless control of the production process, which can be expressed as the implementation of “pollution-free production technology” and the dual control of waste residues.

The third is the improvement of the quality and added value of e-commerce products in the output process and the environmental cost savings brought by the reduction of waste residues of e-commerce products.

From the perspective of the institutional paradigm, the standardized production level of e-commerce production can also be examined at two levels: micro and macro.

From the micro level, the level of standardization is mainly reflected in the organizational structure of e-commerce production and the strategic behavior of micro-rational subjects. The unconstrained, unstable, loose, and self-sufficient retail business model and the intensive business model of scale, industrialization, branding, and production-marketing docking and their evolved intermediate forms constitute the strategic behavior choice set of business subjects. Generally speaking, the change in industrial organization structure and strategic interaction of business subjects tend to change the spatial layout and concentration of e-commerce production and even form a new industrial standardized equilibrium.

At the macro level, the level of standardization of e-commerce production can be determined from the depth and breadth of the role of the bottom-up induced system and the top-down mandatory system and their specific manifestations. In the process of deepening marketization, the large-scale spatial transfer of labor and the allocation of capital flow between industries make the induced institutional changes in labor and capital input mechanisms and industrial organization mechanisms gain certain manifestations.

It is noteworthy that the market demand pull from better quality e-commerce products and the government regulation policy based on privacy security show the basic characteristics of institutional penetration, integration, and blurring of change dynamics and boundaries among different links. Unlike the technology paradigm “unified manufacturing, unified management, unified technology” of “three unified” and “new categories, new facilities, new technologies” of “Three new”. E-commerce production standardization, the system paradigm of e-commerce production standardization not only focuses on the combined effect of factory, labor, capital, technology, brand, and other factors to expand the effective production boundary of e-commerce production, but also focuses on the matching between the elements and system and the system cost savings formed by the compatibility of the system between each link.

4.4.2 Standardization of Production Process

Standard-setting system construction. The framework of the quality standard system, which is mainly national standards and supplemented by local and enterprise standards, has been built: around protecting the ecological environment of e-commerce, improving the quality and safety of e-commerce products, developing e-commerce product quality standards, improving the e-commerce standard system and enterprise standard system; around enhancing the quality of e-commerce products, strengthening the quality of e-commerce production, processing and sales from the source. Safety monitoring, inspection standards, and management standards are further optimized; focus on enhancing the competitiveness of e-commerce products in the market, focus on building high-quality e-commerce brands, and carry out good e-commerce standards certification and geographical product certification.

Quality testing system construction. The government has established a complete set of quality supervision and testing system based on four systems: "risk early warning, quality traceability, quality and safety testing, and emergency response to major events", and formed a quality testing system framework with provincial quality inspection centers as the leading system, municipal (district) quality inspection stations as the basis, supplemented by sampling inspection points in bases and wholesale markets. "Source filing, process supervision and random inspection" ensures the whole process of quality and safety of e-commerce industry "from factory to hand", and also provides strong technical support and effective law enforcement basis for the implementation of e-commerce standardization.

Technology service system construction. Focus on technical guidance services, e-commerce producers to provide daily technical services and information consulting. In accordance with the principle of "applicable, practical and effective", strengthen e-commerce Loco-standardized demonstration management technology and appropriate training. Joint scientific research institutions and e-commerce leading enterprises, the construction of a backbone of enterprise technology, e-commerce research universities and other experts composed of technical services team, from time to time to the e-commerce demonstration area for enterprises to focus on solving the problems encountered in production and operation, the promotion of advanced science and technology. At the same time, the introduction of various preferential policies to attract foreign enterprises, arrange special funds to support scientific and technological innovation, encourage local enterprises to establish intelligent seedling in also, increase the new varieties of e-commerce, processing and packaging technology and the promotion of the project policy tilt and financial support. The government should focus on technical guidance services, provide daily technical services and information consultation for e-commerce producers, and strengthen the training on the appropriate transfer of e-commerce Rolostandardization demonstration management technology in accordance with the principle of "applicable, practical and effective". The government may join forces with scientific research institutions and e-commerce enterprises to build a technical service team composed of enterprise technical backbone, e-commerce research universities and other experts. The service team should

go to the e-commerce demonstration area from time to time to solve the problems encountered in production and operation and promote advanced science and technology. At the same time, the government should also introduce various preferential policies to attract foreign enterprises, arrange special funds to support scientific and technological innovation, and increase the policy preference and financial support for new e-commerce projects.

4.4.3 Standardization of Production Environment

Facility system construction. In order to improve the service life of products and reduce the occurrence of accidents, the management of production equipment should be strengthened. In the construction of the equipment system, the corresponding department will select, purchase, install, maintain, and inspect the required equipment according to the needs of production, and carry out reasonable storage, use, and regular maintenance according to the requirements of the equipment management regulations. If the equipment is aged and cannot meet the work requirements or cannot be used, the using unit should propose technical appraisal and consultation to the technical personnel, and the equipment should be reported to be damaged or scrapped.

Resource system construction. The enterprise should reasonably arrange the production process and use the resources of production activities to achieve the expected production goals. Using the “contract” method, we strengthen the comprehensive ecological protection in the management of production resources and achieve the purpose of ecological management of the enterprise.

Inspection system construction. This usually refers to the quality management of each link after the raw materials enter the warehouse and before the products enter the warehouse. The methods of process inspection are: 1. Combination of first piece self-inspection, mutual inspection, and special inspection; 2. Combination of process control with sampling and inspection; 3. Centralized inspection of multiple processes; 4. Inspection by process steps; 5. Inspection of finished products; 6. Integrated sampling and comprehensive inspection. Process quality management refers to roving inspection during the production process of products, which is carried out by: 1. first piece inspection; 2. verification of production information of raw materials and products; 3. inspection rounds: ensuring proper inspection time and frequency, and strictly following inspection specifications or operation guidelines including product quality, process procedures, machine operation parameters, material placement, marking, environment, etc.

Market system construction. In order to maintain a sound market for the purchase and sale of e-commerce products, the government should improve standardized laws and regulations, and severely punish those who disturb market order. On the other hand, accelerate the construction of e-commerce circulation system and information system.

Implementation of the system construction. Increase policy support tilt, focus project funds, and inject advantageous resources, under the unified coordination of the government to improve infrastructure construction and the mainland rectification, flow, construction of e-commerce standardization demonstration area, e-commerce intensive, large-scale production, and then by the demonstration area of e-commerce production of large enterprises, small and medium-sized enterprises, factories and other business entities to promote the implementation of standardized production.

4.5 Summary of this Chapter

This chapter classifies e-commerce production into “product traceability”, “branding”, “standard construction”, and “production management”. The four parts of the chapter are based on classification and development. Firstly, it introduces e-commerce products, starting with the classification and definition of traditional products, and discusses in detail the definition, attributes, and innovation of e-commerce products, and introduces the e-commerce product traceability system. Next, we introduce the branding of e-commerce products from “geographical indication”, “brand identification”, and “brand maintenance”, and describe the whole process of branding e-commerce products. The requirements and necessity of standardized construction of e-commerce product production are presented from “technology”, “process”, and “environment”, respectively, and finally, the standardized production process and management mode of e-commerce products are proposed. Finally, we propose a standardized production process and management mode for e-commerce products.

In the era of Industry 4.0, e-commerce production should continue to improve in the direction of digitalization and intelligence, and enterprises should create new intelligent manufacturing solutions to help e-commerce enterprises to continuously improve processes, prevent problems, optimize operation time, completely transform the value chain beyond the limits of space, and reshape the core competitiveness of manufacturing enterprises!

4.6 Review Reflection Questions

1. Briefly describe the specific content of the five levels of products.
2. Briefly describe the similarities and differences in the definition of products between the two disciplines of economics and marketing.
3. Briefly describe the definition, classification, and attributes of e-commerce products.
4. Analyze the dynamics and performance of e-commerce product innovation.
5. Talk about your understanding of product traceability system.
6. Briefly describe the significance of brand building to e-commerce.
7. Briefly describe several methods of product positioning with examples.

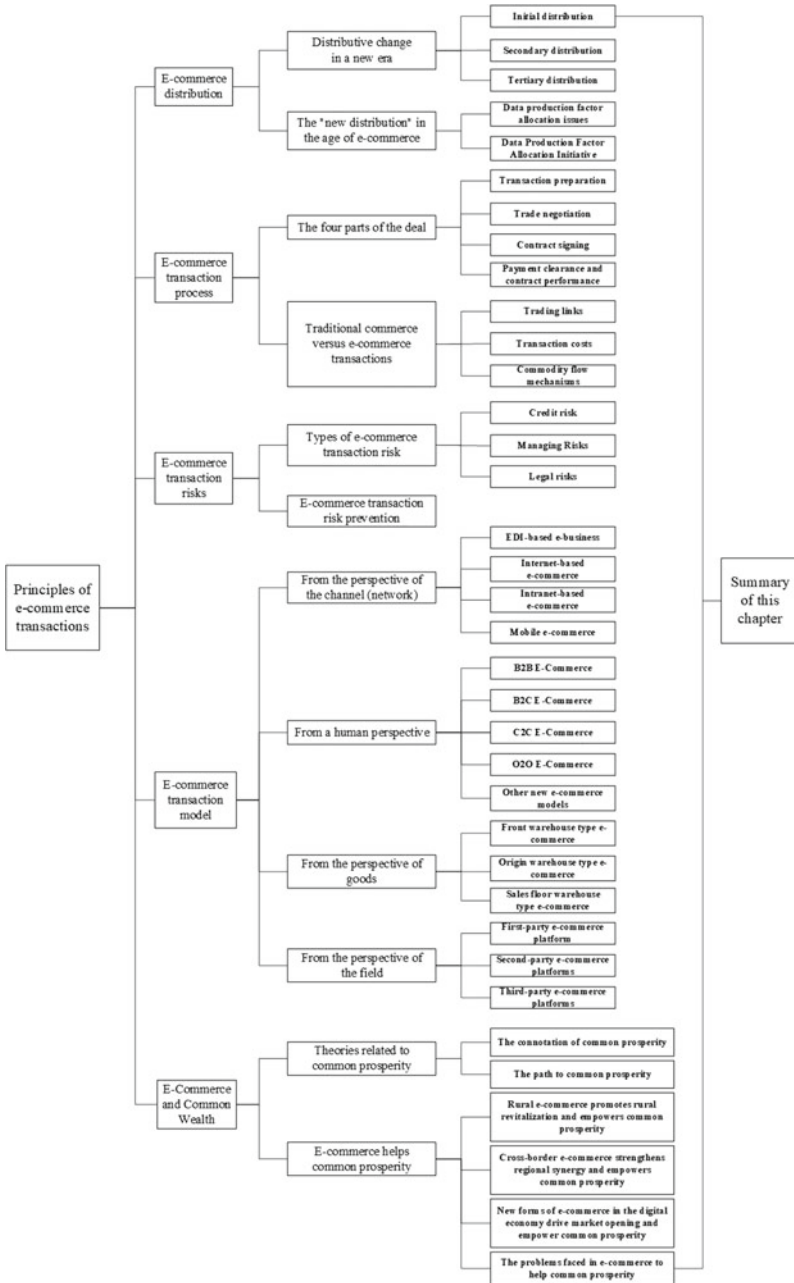
8. Talk about what you know about the brand effect to help business development.
9. Briefly analyze the significance of standardization of e-commerce production.
10. Briefly analyze several aspects and processes of e-commerce production standardization.
11. Talk about your understanding of production management in e-commerce enterprises.
12. Talk about your understanding of reverse production, personalized production, and customized production.
13. Briefly describe each module of production management.
14. Talk about your understanding of information, digital, and intelligent production management.
15. Briefly describe the process of enterprise production management system.

Chapter 5

Principles of E-Commerce Transactions



Knowledge Map of this Chapter



Summary of this chapter

Introductory Case

The Next Taobao? How Many More Problems Does Tiktok E-Commerce Need to Solve

On December 2, 2021, Tiktok tested an app called “Tiktok Box” and positioned it as a trendy e-commerce platform, officially marking the beginning of Tiktok’s exploration of independent e-commerce business. As early as two years ago, Tiktok began to explore its own path of e-commerce. It has taken a series of actions in the e-commerce field, such as blocking third-party links, releasing Tiktok Payments, upgrading Tiktok Mall, laying type logistics, testing the Pick Plan, and building an independent e-commerce platform. It is extremely similar to certain head e-commerce platforms.

Tiktok e-commerce goes independent

In the early stage, ByteDance’s e-commerce business existed in the form of “Cost-Per-Sale”, which collected revenue by channeling traffic to third-party e-commerce platforms and charging commissions. In order to build its own e-commerce platform, in June 2020, the “Tiktok Shop” was established; in October of the same year, Tiktok issued an announcement to block third-party links. At this point, Tiktok has formed a closed-loop e-commerce infrastructure internally, keeping the traffic in-house. In August 2021, the “Tiktok Shop” was officially upgraded to “Tiktok Mall”, forming a centralized e-commerce portal. In December, Tiktok announced that it would test its independent e-commerce app “Tiktok Box” to create a comprehensive e-commerce platform for ByteDance.

Laying out the infrastructure, Tiktok e-commerce opens up the closed loop

To form a true closed loop, Tiktok continues to improve its e-commerce base and diversify its sources of goods. Firstly, payment is a necessary threshold for e-commerce platforms. In January 2021, ByteDance successfully launched Tiktok Payments, which became the cornerstone to help ByteDance realize its financial business. Secondly, a fast and reliable logistics system is another important segment of the e-commerce business. On 25 August, ByteDance set up two logistics services companies in quick succession. In addition, to ensure the safety of logistics data, Tiktok switched to its own electronic face sheet in early August. Although Tiktok attaches great importance to the construction of a logistics system, there are still many difficulties in achieving a fast logistics network layout.

WeChat opens up external links, independent app struggles

At the end of 2021, WeChat officially announced that users could access external links directly in WeChat private chats and group chats, and links to products on e-commerce platforms could be opened to complete orders and payments. This is undoubtedly a huge boon for non-Tencent platforms.

For the Tiktok e-commerce app, which will soon be independent, it still has huge disadvantages of its own. First of all, as a new stand-alone app, the import of user traffic is a major problem; at the same time, after downloading, it is difficult to predict whether a simple live broadcast with goods can attract users to make purchases and complete traffic conversion. Secondly, Tiktok e-commerce has the characteristics of single purchase and instant consumption. It focuses on public traffic and has a very low repurchase rate. For Tiktok, which has chosen shelf e-commerce, it is very difficult to compete with major platforms for quality brand merchants.

It will take more time to explore how to build and operate the platform and how to play the unique advantages of Tiktok against the strong when entering the independent e-commerce app. Please consider what are the specific e-commerce transaction processes in the context of this example. What are the advantages of “Tiktok Box” compared with other e-commerce platforms? What are the risks? Can you choose the right trading model for it in combination with its advantages and design a complete trading mechanism?

Consider.

1. what are the specific e-commerce transaction processes?
2. What are the advantages of “Tiktok Box” compared with other e-commerce platforms? What are the risks? Can you choose a suitable transaction model and design a complete transaction mechanism for it with the advantages?

The principle of e-commerce transactions is mainly to solve the distribution and help the common prosperity.

5.1 E-Commerce Distribution

5.1.1 *Distributive Change in a New Era*

Distribution stems from the circular movement of the national economy. The national economy starts with production and moves through distribution to final consumption and accumulation in a continuous circular movement. Distribution is a very important part of the process of social reproduction. It follows the production chain and connects production to consumption. The ultimate aim is to increase the efficiency of the consumption chain.

Distribution is familiarly defined as the allocation of the various types of labor, the money held by buyers and sellers, the goods that move, and the means of production in the market. Distribution is the mapping of a certain part of the relations of production in social life. It is embodied in the distribution of social goods by members of society, such as the state society, enterprises, and individuals, each of whom appropriates them. The act of distribution is encapsulated in the sector of material production. But distribution is significant because of its ubiquity in society. Distribution is not only the allocation of social goods such as commodities and capital, but also the distribution of the values contained in the aforementioned goods. It is capable of meeting both the needs of social production and social life at the same time. Distribution is thus not only an act, but also a flow of value.

Reasonable distribution can promote the progress of production and social harmony. China's productive forces have developed rapidly in these decades, and the principal conflict of Chinese society has also undergone a great transformation since entering the new era. Such changes have accordingly led to a shift in the connotation of distribution. Xi Jinping's theory of distribution in the new era takes this change as the base for his theory and raises further requirements for distribution. This means that distribution needs to be accessible and needs to be quality. The new era has set new requirements for economic development and social stability, new goals for social reproduction, and new ideas for the evolution of a new pattern of distribution.

5.1.1.1 Initial Distribution

The primary distribution is an allocation by the market in proportion to the contribution made by each factor of production in the social production process. The market distributes rewards based on the marginal contribution of factors and has an important role in the initial distribution of factors of production. It can optimize the allocation of factors of production and improve the efficiency of product production. It is an essential requirement for promoting the achievement of high-quality development. At the same time, it is the basic principle of initial distribution in the Chinese market. Primary distribution is equivalent to distribution by contribution. As long as one can contribute using the factors of production, one gets a share of the pie.

5.1.1.2 Secondary Distribution

The secondary distribution, or also known as social transfer distribution, is the process of redistributing the income of income subjects based on the results of the initial distribution, both in cash and in kind, after government agencies have collected taxes and government non-tax revenues. Unlike the initial distribution, the government is the main body of guidance in this process, and the distribution is more equitable and fair. In addition, basic public services can be a vehicle or the implementation of

redistribution processes. The improvement of basic public services can contribute to sustainable social economy development.

5.1.1.3 Tertiary Distribution

1. Introduction of the concept of tertiary distribution

The tertiary distributions first appeared in an article written by Professor Li Yining, '*On the Path of Economic Development for Common Prosperity*'. The article creatively identifies three forces that affect the distribution of income. The article mentions that moral forces as a third force can influence the distribution of income beyond the forces of market mechanisms and government regulation. The main target group is the high and very high-income groups. This group has accumulated wealth through society and is then expected to give back to society through charitable activities. They should take the initiative in taking up social responsibility and use their social status to drive more people to common prosperity. At the same time, the predictability of the growth of the tertiary distributions is also pointed out in another book by the author. The tertiary distributions in society can be divided, in chronological order, into distributive activities resulting from market regulation, government regulation, and regulation by individual social responsibility, respectively. In Li Yining's definition, the tertiary distributions can be essentially equated with donations.

2. Different discussion of the connotations of the tertiary distributions

The definition of the tertiary distribution is mostly divided into two views in academic circles.

The first view is that the tertiary distributions are social transfers in kind on top of the initial distribution and secondary distribution. As in-kind social transfers are funded by government agencies to provide public consumer goods and public services to individuals, what is covered by the tertiary distributions goes beyond donations and philanthropy.

Another view is that the tertiary distributions cannot be separated from the role of government. This view sees the tertiary distributions as taking place according to conscious and voluntary forms and principles. It is an adjustment under the direction of public interest organizations (e.g. volunteers, charities, etc.) that use ethics and morality as a driving force to move the distribution forward, and is characterized by autonomy and diversity. In this process, the government should play an encouraging and facilitating role. And this view is similar to the first one. It is also argued that the three distributions not only include public goods, but also include the role of government. This view also mentions that "In the process of China's modernization, the tertiary distributions are a major proposition for improving the socialist market economy and dovetailing with national governance in the new era of 'getting stronger'".

In the light of the above, this book argues that the tertiary distributions are related to public charity, and such acts are voluntary and are the “material” externalization of the moral force within.

3. Determination of the content of the tertiary distribution

Han Wenxiu, Deputy Director of the Central Finance Office, elaborated on the important connotations of the tertiary distribution in a topic about common prosperity. He points out that the tertiary distribution is carried out on a voluntary basis by social agents and is not compulsory. At the same time, the State should introduce a corresponding incentive tax policy to complement the distribution structure with charitable acts.

This important statement clarifies the meaning of the three distributions: firstly, it clarifies that the position of the tertiary distributions in improving the distribution structure is “complementary” rather than decisive; therefore, in the process of optimizing income distribution and achieving the goal of common prosperity, the focus remains on the initial distribution and secondary distribution. Secondly, it is clear that the main channel for achieving the tertiary distribution is charitable donations. Thirdly, it is clear that the decision to achieve the tertiary distribution relies primarily on moral force and adheres to the principle of voluntariness rather than coercion. Fourthly, it is clear that the government has a certain status in the tertiary distributions. It plays a role in encouraging acts such as charitable giving through policy actions.

To sum up, the specific connotation of the three distributions and the construction of the framework of “initial distribution, secondary distribution, and tertiary distribution” can promote the increase of income of the low-income groups and eventually achieve the expansion of the middle-income level. The three complementary and mutually supportive distribution systems are of great significance to the formation of an olive-shaped distribution pattern.

Based on the above, the three types of allocations are compared in Table 5.1.

5.1.2 The “New Distribution” in the Age of E-Commerce

The most basic of the three types of distribution is the initial distribution. It is the distribution of the benefits to the holders of two types of capital, money and people. The initial distribution is crucial in all three types of distribution. If there is injustice in this process of initial distribution, the subsequent redistribution and the three distributions will be seriously affected and the outcome cannot be reversed. The absence of regulatory mechanisms in the market for initial distribution can lead to greater disorder in distribution and further exacerbate income disparities. And in the initial distribution, the market plays a decisive role.

The advent of the digital economy has seen the emergence of data in the form of new means of production, driving the development of artificial intelligence. The development of artificial intelligence makes it a new productive force in the new

Table 5.1 Comparison of the characteristics of the three types of distribution

Allocation stage	Initial distribution	Secondary distribution	Tertiary distribution
Target	Efficiency	Justice	Good life
Subject	Labor individual	All individuals	Enterprises/high-income groups
Forces at work	Market forces	Government power	Moral power
Supporting system	Market economy system, etc.	Tax system, social security system, etc.	Incentive system, public welfare guarantee system
Field of action	Market area	Administrative field	Life world
Wealth relationship	Creativity	Distribution	Optimization
Distribution method	Distribution according to work, combining various distribution methods	Tax, social security, government transfer payment, etc.	Charitable donations, grants, etc.

era. The new productive forces in turn bring about new changes (e.g. blockchain changes), which in turn improve the existing relations of production. E-commerce plays an important role in establishing market relations, innovating new industries and services, and driving economic growth in the context of a new era, new relationships, and new productivity. It has had a huge impact on primary distribution and has become an important component and grip of the digital economy. The “new distribution” in the age of e-commerce therefore focuses on the elements of the initial distribution.

Factors of production have been empirically defined in the past to include factors such as labor, land, and capital. In the context of further scientific and technological development and the continuous improvement of intellectual property-related systems and policies, factors of production incorporate knowledge, technology, management, and information into the system. On April 9, 2020, the Central Committee of the Communist Party of China and the State Council, in *the Opinions on Building a More Perfect Institutional Mechanism for Market-based Allocation of Factors* (hereinafter referred to as “*Opinions*”), the State clearly stated that there are five main types of factors to be market-based allocated: land, labor, capital, technology, and data¹ (Fig. 5.1).

Factors of production often need to be used in combination to maximize their effectiveness. Using just one factor of production will not maximize economic growth. Data, for example, is only as effective as the combination of algorithms and models that create value. There are three models for this value creation. The first is value multiplication. When the element of data is integrated with other single elements, the value that can be brought to bear by that single element is multiplied. The second is resource optimization. Combining data with other factors increases the efficiency of

¹ Opinions of the CPC Central Committee and the State Council on Building a More Perfect Institutional Mechanism for Market-oriented Allocation of Factors [EB/OL](2020-04-09) [2022-04-01]. http://www.gov.cn/zhengce/2020-04/09/content_5500622.htm.

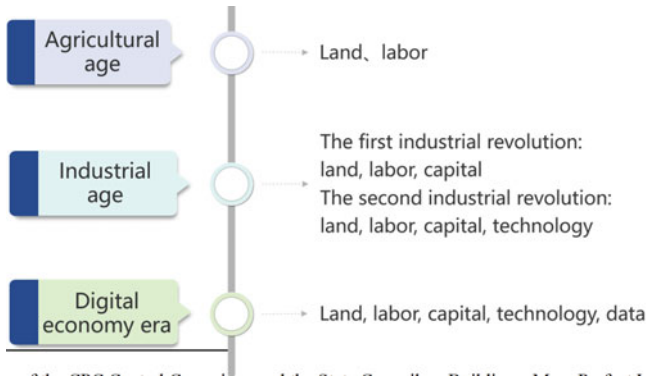


Fig. 5.1 Factor of production change process

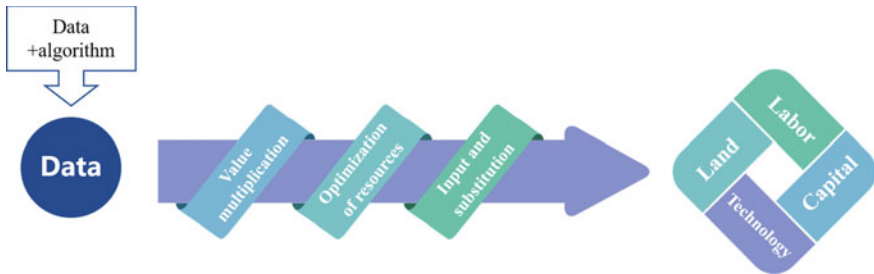


Fig. 5.2 Value transfer mechanisms for data production factors

allocation among traditional factors. The increased efficiency of resource allocation further brings about changes in the factors of production and is the key to increasing the rate of economic growth, which is the most important value of data. The third is input substitution. Data has the effect of activating the innovative capacity of other factors, which means that with the addition of data we can use fewer resources to create more wealth. This has a substitution effect on traditional factors of production (Fig. 5.2).

5.1.2.1 Data Production Factor Allocation Issues

As a factor of production, data may have the following problems: firstly, the initial investment is large and the property rights are not clear. From data generation to storage, this whole process cannot be done without the support of infrastructure. The infrastructure is often built by both the government and the enterprises who invest in the means of production. Nevertheless, the government should also draw a clear line with the market and let the market play its own role. Secondly, there is a first mover advantage and a monopoly situation is easily created. Data has a non-competitive

nature of consumption, no marginal cost, and a first mover advantage. Thirdly, there are externalities. And there are positive and negative externalities. A positive externality connotes that the producer's production behavior generates benefits for others, but the producer does not receive compensation for these benefits. Negative externality is mainly reflected in the security of the data. If data is used illegally, it can cause substantial property damage and even threaten the personal safety of the user. In contrast to the positive externality, the producer's production behavior imposes costs on others and third parties are not compensated for the increased costs.

5.1.2.2 Data Production Factor Allocation Initiative

1. Focus on sharing and openness of data

In an era of coexistence and sharing with big data, data is not only required to be large in quantity, but also to be used live. This is the standard by which data can be used for its value. Openness and sharing is the best form to maximize the value of data. Data will be improved more fully with continuous use, constantly generating new value, and forming new connotations. The development of cloud computing is driving the process of bringing data to life. With the continuous development of cloud computing, large amounts of data can be exactly linked to the products and scenarios and are needed for further applications.

2. Focus on the protection of the rights of the data source

How data is used is an important issue, especially personal data of consumers. It is important to respect and maintain the security of personal information and privacy in the process of use, and to comply with relevant national laws and regulations. A good grasp of the "degree" of data use is necessary to better utilize the benefits of data and to further promote the use and sharing of data in a virtuous circle.

3. Selecting the right data empowerment model

The empowerment of data should take full account of whether resources, technology, etc. have been invested in its formation. By clarifying the ownership of the original data, the operators in the network have an interest in all data derived from it. Not only can they use the data to balance their interests, but also can use the data to achieve further technological innovation and productivity improvements, thus contributing to socio-economic development.

4. Focus on data mining

The most important feature that makes data different from other factors of production is that it has potential value. The faster the rate of technological progress, the higher the value of data. The more data is processed, the higher the value of the data. There is no useless data in this world, only data that has not been properly processed and not seriously mined. Furthermore, as different subject sectors have different needs for data, this one aspect of data mining is mostly shared by all parties and mined on

demand. The use of the data information mined by themselves for production development ensures that the data is diversified in different dimensions and in different areas.

5.2 E-Commerce Transaction Process

A transaction is an exchange of value between two parties using money and services as a medium. The transaction process is the entire process of operations and processing carried out by the parties to the transaction in order to complete the transaction.

5.2.1 The Four Parts of the Deal

Taking the “three flows” of information, capital, and logistics as the starting point, the transaction is divided into four parts: transaction preparation, trade negotiation, buyer’s credit risk and payment clearance and contract performance. This is illustrated in Fig. 5.3.

5.2.1.1 Transaction Preparation

In a broader sense, the transaction preparation phase is when the parties involved in the transaction prepare for the contract. The buyer needs to draw up a shopping list

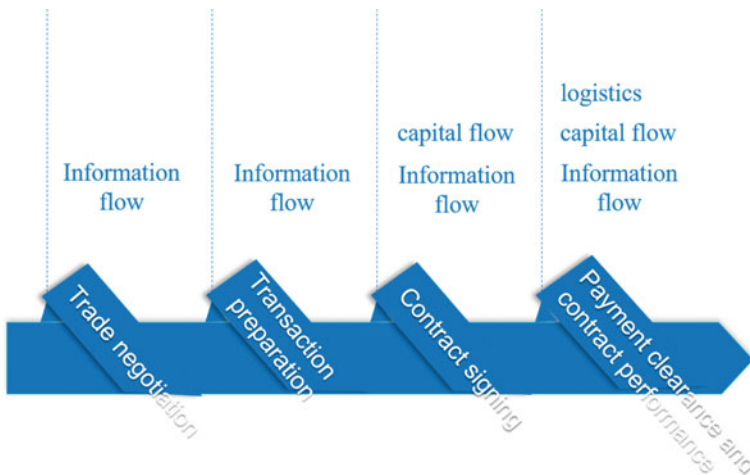


Fig. 5.3 The four components of trading

and a transaction plan according to his own preferences, conduct a product search and complete various comparative analyses. At the same time, the buyer has to adjust his shopping plan to the information of different sellers and products, and finally decide on a plan that maximizes his interests. Sellers need to conduct a comprehensive market research and analysis for the type of products they sell. You need to understand the current state of the market and what other competitors are selling, and develop an appropriate sales strategy and approach based on the characteristics of your product. Increase the visibility and impact of your products through effective marketing techniques. Find the right buyers to trade with, create opportunities to trade, expand your influence, capture market share, etc. In addition to the buyer and seller, there are other third parties such as intermediaries, banks and financial institutions, and logistics companies that will be present at some point in the preparation of the transaction.

In a narrower sense, the transaction preparation phase refers to buyers and sellers posting information about their needs for a transaction via the Internet, searching for opportunities and objects for a transaction on the Internet, and learning about the rules and conditions of the transaction. Other subjects involved in the preparation of the transaction are no longer considered as core elements and are therefore not included in the analysis.

Whether from a broad or narrow perspective, the relevant activities of the various participants in the transaction preparation phase mainly involve the transmission of information flows. In general, this phase is mostly analyzed using a narrow perspective, focusing only on the buyer and seller.

5.2.1.2 Trade Negotiation

At this stage, the buyer and seller begin to contact each other. Specific details of the sale are negotiated via mobile devices or directly in person, such as specific information about the goods, prices, offers, follow-up cooperation, etc. Eventually, the above details are finalized in the form of contracts. The consumer collates the information available, selects the goods to be purchased, and reaches an intentional textual framework agreement with the vendor during the trade negotiation phase. The activities related to the buyer and seller during the trade negotiation phase mainly involve the transfer of information flows.

5.2.1.3 Contract Signing

This stage refers to the implementation of a textual framework agreement between the buyer and seller, culminating in a contract in written form or as an electronic document. At this stage, the relevant activities of the buyer and seller involve not only the transmission of information flows, but also possibly the transmission of financial flows, such as the contractual requirement for an advance deposit.

5.2.1.4 Payment Clearance and Contract Performance

In this stage, the process of receiving and settling payments from both parties and finalizing all stages of the transaction, i.e. obtaining the result of the transaction, is handled according to the terms listed in the contract and the contract performance of both parties, such as the completion of payment by the buyer, delivery by the seller and confirmation of receipt by the buyer. During this stage, information flow, logistics, and capital flow are involved.

5.2.2 *Traditional Commerce Versus E-Commerce Transactions*

5.2.2.1 Trading Links

Traditional commerce, like e-commerce transactions, consists of the four transaction aspects mentioned above. However, the process by which the transaction aspects of traditional commerce operate differs significantly from that of e-commerce transactions.

1. Traditional business transaction chain

In traditional commerce, the media relied on for the preparation of transactions mainly include television, radio, and leaflets. Through these channels, the buyer puts out information about the goods being traded, and the seller can search, match and compare information about the goods. Trade negotiations are mainly completed through offline communication, fax, email, and telephone. After completion, paper trade documents are left behind, such as delivery notes, contracts, and sales invoices. At the stage of contract signing, a paper-based trade contract with legal effect is signed. This guarantees the outcome of the trade negotiations and thus monitors the execution of the contract. During the payment clearing and contract fulfillment phase, there are two main methods of payment: cheque, which is mainly used in trade with larger amounts of transactions between businesses, and cash, which is mainly used for small transactions, where one of the parties is usually an individual and the transaction is generally retail. Contract performance is mainly achieved directly offline.

2. E-commerce transaction links

In e-commerce, in the preparation phase of a transaction, all kinds of information related to the products that need to be traded can be published and retrieved via the Internet. Comparisons are made by means of the Internet, and the range of options for the type of goods and the comparable range of information on goods is much wider. The matching of information is characterized by speed, efficiency, precision, and individuality. During the trade negotiation phase, paper-based trade documents are transformed into electronic records and documents by virtue of the Internet feature

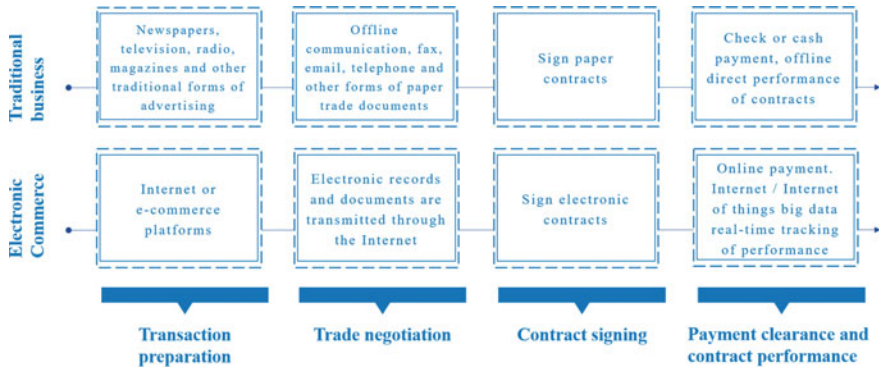


Fig. 5.4 Comparison of traditional commerce and e-commerce transaction processes

and are transmitted via the Internet. At the contracting stage, paper-based contracts are no longer the norm, but are replaced by third-party authorized electronic contracts. In the payment clearing and contract fulfillment stages, online payment methods such as credit cards, e-check, and e-money can be used, making it more convenient. At the same time, contract performance is made transparent. The performance of the transaction participants can be tracked in real time via the Internet or IoT big data. For example, whether the payment is made, whether the goods are shipped, whether the goods are transported normally, whether the goods are rejected, etc. (Fig. 5.4).

5.2.2.2 Transaction Costs

Economic activity is inseparable from costs, and costs are incurred at every stage. Costs incurred in the production chain include, but are not limited to, raw materials, labor, product manufacturing, etc. Costs incurred in the transaction chain include, but are not limited to, information retrieval, trade negotiations, etc. Costs incurred in the distribution chain include, but are not limited to, time, logistics information, capital, etc. Costs incurred in the consumption chain include, but are not limited to, costs of purchase and use in the form of monetary expenditure, and costs of time, energy, physical effort, etc. in the form of non-monetary costs. In the consumption chain, consumption costs include monetary costs (consumption price costs, purchase costs, use costs) as well as non-monetary costs (consumption time costs, consumption physical costs, consumption mental costs). At the heart of e-commerce activities is the facilitation of transactions. Therefore, the main focus is to provide an in-depth introduction to e-commerce transaction costs. Compared to traditional offline transactions, e-commerce transactions take place on the Internet, with all transaction aspects and the entire transaction process being completed in the information platform, greatly reducing transaction costs.

In 1937, Ronald H. Coase first introduced the idea of “transaction costs”, stating in his article “The Nature of the Firm” that transaction costs are “the most obvious

costs of organizing production through the price mechanism, that is, all the costs of discovering relative prices”, “the costs of negotiating and contracting for every transaction that occurs in the market and the costs of using the price mechanism for other aspects of existence”. Subsequently, a group of economists constructed emerging classical economics on this basis, focusing on the costs incurred in transactions, i.e. exogenous and endogenous transaction costs. These two types of transaction costs represent, respectively, all the costs actually incurred in the transaction process, and the costs (measured in terms of probabilities and expectations) arising from the risks that may be incurred in the transaction process. Academics have defined transaction costs in both broad and narrow terms. Broadly defined transaction costs are all costs that occur in a non-Robinsonian economy. Narrowly defined transaction costs are exogenous transaction costs, including those incurred in the search, negotiation, and implementation processes. This book focuses on narrowly defined transaction costs.

For the two main subjects of market transactions, vendors and consumers:

$$\begin{aligned} \text{transaction cost } C^T &= \text{search cost } C_S^T + \text{negotiation cost } C_N^T \\ &+ \text{implementation cost } C_I^T \end{aligned}$$

where search cost C_S^T , negotiation cost C_N^T , and implementation cost C_I^T all have a positive effect on transaction cost C^T .

1. Search cost C_S^T

$$C_S^T = C_{S1}^T(d) + C_{S2}^T(t)$$

Search cost C_S^T is the cost that consumers have to pay to obtain relevant information about a good, or the cost for manufacturers to capture potential consumers and advertise their products to them. $C_{S1}^T(d)$ is the cost of search space, influenced by the distance d between the consumer and the vendor (shop). $C_{S2}^T(t)$ is the cost of search time, influenced by the time required to search, purchase t . And $C_{S1}^T(d) > 0$, $C_{S2}^T(t) > 0$.

E-commerce transactions rely on the Internet, there are no time and space limitations, and the distance and time spent in searching for information or products is significantly reduced, i.e. $d_E < d_T$, $t_E < t_T$, so:

$$C_{SE}^T = C_{S1}^T(d_E) + C_{S2}^T(t_E) < C_{ST}^T$$

2. Negotiation costs C_N^T

$$C_N^T = C_{N1}^T(m) + C_{N2}^T(n)$$

$C_{N1}^T(m)$ is the negotiation space cost, influenced by the distance m between the consumer and the merchant. $C_{N2}^T(n)$ is the negotiation time cost, influenced by the

time n between negotiations between the parties to the transaction. And $C_{N1}^{T'}(m) > 0$, $C_{N2}^{T'}(n) > 0$.

The elements of the negotiation process change as e-commerce transactions are negotiated over the internet. $m_E < m_T$, $n_E < n_T$, so:

$$C_{NE}^T = C_{N1}^T(m_E) + C_{N2}^T(n_E) < C_{NT}^T$$

3. Implementation costs C_I^T

The implementation cost C_I^T is the cost of storage logistics and the cost of shop shelf placement arising from transactions not occurring at the same time. In the e-commerce transaction link, both sides of the transaction can complete real-time transactions and real-time delivery through the network, which greatly reduces or even avoids the cost of storage logistics and shop shelf costs, i.e.

$$C_{IE}^T < C_{IT}^T$$

In summary, transaction costs under the e-commerce model:

$$C_E^T = C_{SE}^T + C_{NE}^T + C_{IE}^T < C_T^T$$

As you can see, e-commerce transactions have increased the efficiency and significantly reduced the cost of trading goods.

5.2.2.3 Commodity Flow Mechanisms

1. Traditional business commodity flow mechanisms

In traditional commerce, goods pass through a series of intermediaries from the time they are produced to the time they reach the consumer, an 'indirect' flow mechanism. This mechanism involves a large number of links, which leads to a significant increase in distribution costs such as transport and storage costs. In addition, at each level of intermediaries, the price of the goods increases to meet the intermediaries' own interests. As a result, the price difference between the ex-factory price and the selling price is so great that the consumer's purchase cost is much higher than the production cost of the goods. Some producers have adopted a model of direct selling, whereby the goods produced are transported directly to the retail end, directly to the consumer. Although such a flow mechanism directly reduces the price and increases the sales of goods, it also increases the cost of sales for the producer and therefore does not bring greater benefits to the producer (Fig. 5.5).

2. E-commerce commodity flow mechanisms

The emergence of e-commerce has led to a dramatic change in the flow of goods, with the emergence of two commodity flow mechanisms: the commerce model and

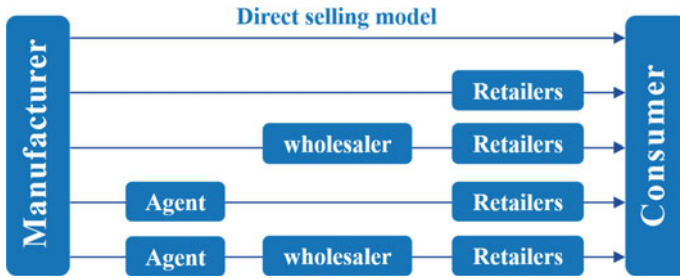


Fig. 5.5 Traditional business commodity flow mechanisms

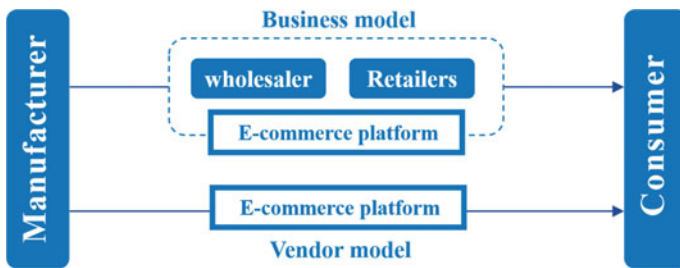


Fig. 5.6 E-commerce commodity flow mechanisms

the vendor model. The merchant model refers to the sale of goods by wholesalers and retailers through the Internet or e-commerce platforms. The vendor model bypasses the middleman and establishes the most direct consumer-facing flow channel. This means that goods are delivered directly to consumers via the internet platform, while obtaining time-sensitive, high-value demand information and feedback from consumers. This enables unhindered information exchange, which can continuously accelerate the upgrading and innovation of products and the improvement of services (Fig. 5.6).

5.3 E-Commerce Transaction Risks

5.3.1 Types of E-Commerce Transaction Risk

E-commerce transaction process refers to the whole process of transaction through the Internet platform in the network environment. E-commerce has become more and more advanced with the progress of the times and the development of technology. On this basis, enterprises have introduced e-commerce and applied it to all aspects of production and sales, helping them to better promote their products and reduce the intermediate links from production to sales, which in turn reduces the

cost of transactions. At the same time, based on the e-commerce platform, enterprises can establish a deeper connection with consumers and increase the possibility for consumers to make transactions. Although the application of e-commerce has brought a lot of benefits to enterprises, due to the virtual nature of the network, the non-directed nature of transactions and the security of payments, the subjects of transactions through e-commerce often bear different degrees of security threats, i.e. e-commerce transaction risks. E-commerce transaction risk is generally divided into three kinds. They are credit, legal, and management risks. Management risk and legal risk are external factors of the risk of the transaction subject, which produce external constraints on all parties in B2C transactions. Transaction risk is an intrinsic factor of the risk of the transaction subject, which shows the psychological and behavioral characteristics associated with the transaction subject.

5.3.1.1 Credit Risk

The market economy is another form of commodity economy. It is a commodity economy following the creditization of the market, and credit is a very important part of market transactions. Especially after the gradual globalization of the economy, credit has become a credential for access to international markets. At the same time, credit is the basis for the existence and development of e-commerce.² Trust between the parties to a transaction plays a far greater role in e-commerce transactions than it does in traditional transactions. The connotation of e-commerce credit is the interactive trust relationship formed between the parties involved in e-commerce transactions. Credit risk is the risk that after the party providing credit keeps its promise and delivers the promised product or service to the other party within a specified period of time, the party receiving the credit therefore faces the risk of refusing to perform as promised for various reasons.

Credit information asymmetry often occurs in the e-commerce transaction environment due to uneven credit between buyers and sellers. We refer to this situation as credit risk. Credit risk is more evident in the context of the Internet. The transaction parties are more cautious because they cannot be informed of the authenticity of each other's information and credit. The credit risk in e-commerce transactions is divided into buyer, seller, and buyer-seller coexistence credit risk according to the different subjects of credit risk.

1. Buyer's credit risk

Buyer's credit risk is the risk of buyer's default or delayed performance faced by the seller of an e-commerce transaction after normal performance of commitments. The main manifestation is the buyer's refusal to pay within the specified time for various reasons. And the purpose of this behavior is generally twofold. One is to use this amount owed to blackmail the seller to get more concessions to reduce their own

² QinZheng. Introduction to Electronic Commerce (6th Edition) [M]. Higher Education Press, 2019.

costs. The second is to buy a time gap and use this time to invest this money that should have been repaid in other investments to gain additional profits.

2. Seller's credit risk

Seller's credit risk refers to the risk of seller's default or delay in performance after the buyer of an e-commerce transaction has normally fulfilled its commitments. It mainly includes the following types.

(1) False Information

The most frequently occurring risk in e-commerce transactions is false information. In the process of e-commerce transaction, the seller may release false and exaggerated information or provide false information about the goods to the buyer, etc. for reasons such as quickly attracting customers, expanding sales, and avoiding bearing transaction risks.

(2) Delayed delivery

Delayed delivery means that the seller does not send out the product or provide the service within the agreed time frame as specified in the contract. Two purposes may exist. One is to blackmail the mention of higher prices. The second is to earn the price difference in anticipation of the price increase process and seek greater profit.

(3) Quality problems

A quality problem is a defect in the quality of the goods provided to the buyer that affects the use or even makes it impossible to carry out the use. The reason for providing goods of relatively poor quality is to save costs, to be second best, or can be seen as an indication of abandoning the transaction.

(4) Quantitative problems

A discrepancy in the quantity of goods is when the seller does not provide the buyer with the actual quantity of goods according to the specifications agreed in the contract or order. In order to maintain customers, sellers sometimes take orders for large quantities of merchandise when the quantity of merchandise is insufficient and subsequently replenish them through production.

1. Coexistence of credit risk between buyers and sellers

Co-existing credit risk between buyers and sellers refers to the credit risk that can arise for both buyers and sellers. The main types include the following.

(1) Transaction Repudiation

Transaction repudiation is when a buyer or seller no longer recognizes the agreement for various reasons after the contract has been signed and becomes effective. They refuse to recognize the terms in the contract by various means and refuse to acknowledge that the contract has legal effect. There are two types of transaction repudiation: complete repudiation and incomplete repudiation. A complete repudiation is a refusal by a party of a contract to recognize the entire contract. Incomplete

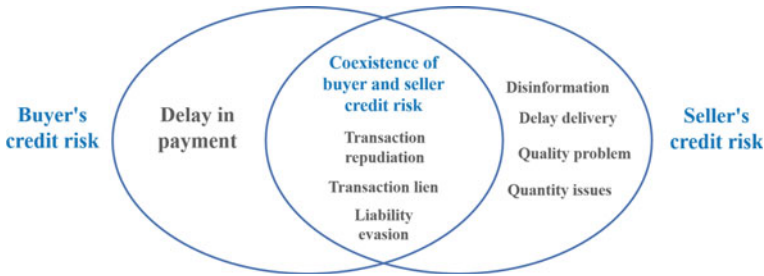


Fig. 5.7 Credit risk relationship diagram for e-commerce transactions

repudiation is when a party of a contract refuses to recognize certain provisions of the contract. The purpose of the two is different: the former is to stop the transaction outright, while the latter is to amend the terms to make the transaction more favorable to its own party.

(2) Transaction Liens

Transaction lien refers to the transaction contract being concluded, one party unilaterally terminates the transaction behavior, resulting in the entire transaction activities interrupted on hold, forcing the other party to assume responsibility for breach of contract.

(3) Responsibility Avoidance

Liability avoidance is mainly for e-commerce platforms. It refers to the refusal of an e-commerce platform to make amends after initiating a certain behavior that should be directed to the subject of the transaction. For example, as the e-commerce platform forcibly closes certain non-compliant platform stores, this leads to the ongoing transactions in the stores being forcibly shut down, and customers' information and funds suffering losses, but the platform refuses to pay out or assume corresponding responsibilities (Fig. 5.7).

5.3.1.2 Managing Risks

Management risk refers to poor management, errors in judgment, technical defects, and other reasons in the e-commerce transaction link, affecting the entire transaction process or even bringing losses to both sides of the transaction. Management risks are divided into three kinds. One is the management risk of transaction process, i.e. unstable transaction pattern and lagging market response caused by improper process setting and poor management in e-commerce transactions. The second is the management risk of personnel, which often occurs in the human resource department in the case of recruitment failure, members leaving, etc. and may affect the normal operation of the enterprise. The third is the management risk of trading technology, which is the most central part of management risk and will be highlighted next.

Since e-commerce is different from traditional commerce, various information technologies are inevitably involved in conducting transactions. While enjoying the benefits brought by technology, you will also face the corresponding technology risks. The management risks of transaction technology mainly include the following types.

(1) Information interception and theft

Information interception and theft refers to the interception and theft of messages sent by others through technical means without permission, thereby obtaining the secrets of others. For example, the consumer's bank account number, password, and the transaction contract between the two parties to the transaction.

(2) Information tampering

Information tampering means that the attacker obtains the original information through interception and modifies the original information before sending it to the original address, thus destroying the correctness and integrity of the information. Such means of disruption mainly include tampering, deletion, and insertion. Tampering is changing the order of transaction information flow and changing the content of transaction information. For example, purchase payment object, payment amount, quantity of goods, address from which goods are sent, transaction time data, etc. Deletion means deleting a transaction message or some parts of the transaction message. Insertion meaning inserting some other information into the transaction information that does not exist originally, so that the receiver cannot read or read the wrong information.

(3) Information Counterfeit

Information counterfeiting refers to attackers deceiving users by forging information or disguising their identities. The general counterfeiting methods include two kinds, one is forging emails and forging users, and the other is forging the legitimate identity of others. The former mainly forges the sending of emails and order forms, or steals various information in the hands of merchants with fake user identities. The latter mainly uses other people's legitimate identities to consume and plant, or impersonates hosts, network control programs, etc. to deceive users or even occupy their resources.

5.3.1.3 Legal Risks (Intellectual Property Risks, Etc.)

Legal risks are mainly manifested as institutional constraints on the market transaction environment and subjects. It includes the establishment of various legal systems around the rights and interests of consumers and service providers and the soundness of related systems, such as intellectual property infringement risk and tax legal risk.

1. Risk of intellectual property infringement

In the era of electronic commerce, intellectual property risks are mainly manifested in the strong conflict between the new characteristics of information in the era of electronic commerce and the characteristics that intellectual property has. For example,

the proprietary nature of intellectual property is difficult to reflect and control in an open, public and shared environment like the Internet, and its territoriality conflicts with the borderless nature of network transmission. For these reasons, the risks of intellectual property rights in the field of e-commerce make it even more important for companies to pay attention to them. The intellectual property issues involved in e-commerce activities often include domain names, materials, databases, software, and other elements, which in turn overlap and conflict with intellectual property issues such as patents, trademarks, copyrights, and copyrights. Therefore, in the field of e-commerce, the protection of intellectual property rights is urgent. Only when the security of intellectual property rights is fully ensured can the development of e-commerce be further promoted.

2. Tax legal risk

Anonymity and globalization are the most important features of e-commerce, which makes it more difficult for taxpayers to verify. E-commerce is different from traditional business transactions. When the laws used to regulate taxation in traditional commerce are applied to the field of e-commerce, they are better than nothing. This has led to the phenomenon of tax evasion in the field of e-commerce, which has seriously affected the healthy development of the industry. This has created a great problem for the government's work.

There are tax legal risks in the field of e-commerce, mainly because e-commerce has five characteristics: addressless, paperless, invisible, borderless, and good concealment of taxpayers' identity. First of all, addresslessness makes it impossible for tax authorities to know the exact location of stores operating on the Internet. There are many e-commerce business stores that have no real common address, which makes the basis of source confirmation in tax policy laws missing. Then the paperless abandoned paper vouchers, complete digital form to save information. It is concealed and confidential, but it is more difficult for tax authorities to track and control. Then is intangibility. Part of the taxation object changes tangible products to intangible products, so that the nature of the taxation object is difficult to determine. Next is the borderless feature, which breaks down the traditional concept of regional operation. Since multiple regions are involved, it is difficult to define the jurisdiction of tax collection. Finally, the identity of taxpayers is hidden, and the anonymity of the Internet makes it possible to hide the identity of taxpayers, which makes it more difficult to collect taxes.

5.3.2 E-Commerce Transaction Risk Prevention

The prevention of e-commerce transaction risks requires the joint efforts of the government, enterprises, and consumers to create a fair, open, transparent, and mutually beneficial e-commerce transaction environment.

For government departments, we should strengthen the legal protection of policy regulation, improve the credit protection system and complete the tax collection and

management mechanism. The improvement of the credit guarantee system can be accomplished by means of improving the loopholes of third-party trading platforms, the real-name system of Internet transactions, and the establishment of personal integrity credit files. The completion of the tax collection mechanism can be done in the following ways: (1) Combining with technological means to transform the form of tax collection for e-commerce transactions. (2) Diversification of tax collection methods to control and implement tax jurisdiction. (3) Interconnection with financial institutions to keep track of tax collection and management information.

For enterprises, we need to accelerate the technology upgrade to ensure the level of security. By improving the technology to ensure the transaction security and information security in e-commerce transactions. The specific security technology has been introduced in the section of “E-commerce Security Technology”.

For consumers, it is important to strengthen the awareness of risk identification. The first is to choose a trustworthy trading partner, using reputation, credit, address, and word of mouth as the most important evaluation criteria. The second is to choose a large, guaranteed trading platform. Be skeptical of websites that you have not heard of, that do not have a large number of purchasers, and that are not well visited, and do not place orders easily. The third is to choose a common and legal transaction method. It is best to pay through a third-party payment platform. With the existence of an intermediary platform, the property security issues of both buyers and sellers are fully protected. The fourth is to retain all records and evidence of the transaction process because voice call recordings, chat records, remittance slips, shopping documents are important evidence in the event of special circumstances to defend rights. The last is to remain cautious. Do not trust anyone, any information easily. All kinds of passwords are strictly confidential and updated regularly.

5.4 E-Commerce Transaction Model

E-commerce has different divisions according to different criteria. For example, the classification based on e-commerce participant includes B2B, B2C, etc. Classification based on e-commerce transaction objects, including tangible e-commerce and intangible e-commerce. Based on the scope of e-commerce transactions, including regional e-commerce, remote domestic e-commerce, and global e-commerce. Based on different perspectives, the classification results also vary. The main link and ultimate purpose of e-commerce is to complete the commodity transaction through online. Therefore, based on the four elements of transaction composition, namely “channel”, “people”, “goods”, and “field”, we propose a new classification method of e-commerce.

E-commerce is a new business operation mode based on browser and server in an open network channel, in which transaction subjects conduct transactions without

meeting each other and complete various business, financial and other related activities. The major online platforms (“fields”) provide consumers (“people”) with high-quality, inexpensive goods (“goods”), attracting consumers to buy while prompting more businesses (“people”) to move in.

5.4.1 From the Perspective of the Channel (Network)

From the perspective of channels (networks), e-commerce can be divided into EDI-based e-commerce, Internet-based e-commerce, Intranet-based e-commerce, and mobile network-based e-commerce.

5.4.1.1 EDI-Based E-Business

EDI-based e-commerce refers to electronic transactions in the form of EDI using private networks or value-added networks (VANs).

EDI (electronic data interchange) is also known as electronic data interchange. The International Organization for Standardization defines EDI as a method of electronic transmission of business or administrative transactions from computer to computer in a structured transaction processing or document data format according to a recognized standard. In short, it is the exchange and processing of data (e.g. various documents, various reports, etc.) that have been standardized and formatted between the computer systems of transaction subjects according to an agreement. The application of EDI in international commerce has brought trade to a new stage, namely paperless trade. Entering this stage has brought good impact to promote global economic development.

5.4.1.2 Internet-Based E-Commerce

Internet-based e-commerce refers to the use of the Internet for electronic transactions. The Internet is a loosely organized, independently cooperative international Internet using the TCP/IP protocol. Due to the unique advantages such as low price, wide range, and many functions, Internet-based e-commerce has achieved a good development.

5.4.1.3 Intranet-Based E-Commerce

Intranet-based e-commerce is to conduct electronic transactions in the Intranet network established by Internet technology. Intranet is an intra-enterprise network developed on the basis of Internet, which is formed by attaching some specific software to the original LAN and connecting the LAN with Internet. It is based on

TCP/IP protocol and Web as the core application, which constitutes a unified and convenient information exchange platform. Intranet is the embodiment of the MIS system within the enterprise. The easiest example of Intranet commerce to understand is the information management system of a shopping mall or supermarket, which enters information and processes it through the checkout counter (front desk) and manages it overall in the back office.

5.4.1.4 Mobile E-Commerce

The combination of mobile communication and the Internet has led to the formation of the mobile Internet. It is a new type of open telecommunication infrastructure network, which combines the advantages of both mobile communication and the Internet. Therefore, it has the characteristics of open sharing, interconnection, and crossing time and space. With broadband IP as the core of the technology, mobile Internet provides users with voice, data, multimedia services, and other various applications through carrier access to the Internet.

The development of e-commerce has given rise to a number of field-related concepts, such as Mobile e-commerce, which is different from ordinary e-commerce in that the carrier for the application of such e-commerce is cell phones, computers, and other mobile terminals. E-commerce based on mobile Internet combines the technologies covered by mobile Internet with e-commerce, which makes e-commerce break through time and space limitations. It enables people to conduct shopping transactions and various activities at different times, in different places and in different forms, at any time.

5.4.2 From a Human Perspective

From the perspective of people, that is, from the perspective of transaction subjects, e-commerce can be divided into the following basic modes: B2B e-commerce, B2C e-commerce, C2C e-commerce, O2O e-commerce, and other new modes.

5.4.2.1 B2B E-Commerce

1. Definition of B2B e-commerce

The subjects of B2B (business-to-business) e-commerce transactions are all businesses. They transmit data and information via private networks or the internet. B2B e-commerce uses B2B websites and mobile clients to connect intranet products and services with customers, thereby providing better services and a better consumer experience for customers. B2B e-commerce transaction objects are relatively fixed,

the transaction process is complex but standardized, and the transaction objects are extensive.

2. Types of B2B e-commerce transactions

According to the transaction mechanism, B2B e-commerce models can be divided into the following four categories.

(1) Vertical type

Manufacturing-oriented or business-oriented vertical B2B (direct industry vertical B2B). This type of B2B e-commerce model has two directions: upstream and downstream, with the manufacturer as the middle of the entire supply chain, with supply relationships between suppliers upwards and sales relationships with distributors downwards.

(2) Comprehensive type

B2B for intermediate trading markets. Comprehensive B2B is also horizontal B2B, in which it provides a platform for similar transactions in various industries, bringing sellers and buyers together to provide trading opportunities. It facilitates the exchange of information between the two sides of the transaction.

(3) Self-built type

Self-built B2B generally only the head of the industry can do. Enterprises with strong capital and demand, based on their own situation, choose to build their own e-commerce platform, using this platform as a platform for industry chain communication and transactions.

(4) Affiliate Type

Affiliate B2B is the industry integration of vertical and integrated these two B2B models to establish a cross-industry e-commerce platform, the purpose is to enhance the coverage and accuracy of information on e-commerce trading platforms.

5.4.2.2 B2C E-Commerce

1. Definition of B2C e-commerce

B2C e-commerce is an e-commerce in which enterprises sell products and services directly to consumers. The specific connotation is a retail mode in which enterprises deliver various business transaction service activities to consumers in the form of data and information through the Internet, so that consumers can participate directly. Therefore, it is also called e-tailing (e-sales) or network sales.

2. Types of B2C e-commerce transactions

(1) Brand vertical type

The most typical of brand vertical e-commerce is the official website of electronic product brands. All branded vertical e-commerce companies need to have considerable brand influence and product types and reserves in order to get enough traffic to meet the needs of users.

(2) Platform integrated type

Platform-based integrated e-commerce is relatively large, and to increase revenue, it needs to insist on opening up more of its platform business. So for integrated e-commerce, it is more about expanding their own category range, while combining the user's consumption behavior and providing the most appropriate service according to the user's personal situation. The current mainstream integrated e-commerce platforms are based on user portraits, with the help of big data analysis to carry out accurate marketing, to enhance user stickiness while achieving more value-added revenue.

(3) Platform vertical type

Platform-based vertical e-commerce combines the advantages of both categories, providing multiple choices while refining the classification of individual categories, showing the characteristics of "small but precise". For customers, such a platform can meet their individual needs in many ways. Especially in markets with high professionalism and low standardization, consumers need more distinctive services.

5.4.2.3 C2C E-Commerce

1. Definition of C2C e-commerce

C2C e-commerce is consumer-to-consumer e-commerce, specifically connoting the provision of products or services by individual workers to individual consumers. C2c e-commerce is a business model developed on the basis of the integrity of both parties, based on internet technology to achieve sustainable development and promote the growth of a green economy.

2. Types of C2C e-commerce transactions

In terms of website transaction classification, C2C model websites can be divided into two categories. Comprehensive C2C websites and vertical/industry C2C websites. In terms of products and services in the market, the C2C model can be divided into three main categories: i.e. product and service-oriented transactions, redistribution of the market, and collaborative sharing. The first one is mostly applied to the leasing field, the second one belongs to the transfer and redistribution of ownership, and the third one mainly includes the sharing of assets and skills.

5.4.2.4 O2O E-Commerce

1. Definition of O2O e-commerce

O2O means Online to Offline, which refers to the combination of e-commerce and offline, turning the Internet into the first step to conduct transactions offline. The most important feature of the O2O model is that the effect of online promotion is traceable and every transaction generated can be tracked.

2. The operation process of O2O e-commerce

Unlike traditional offline consumption, the consumption process of O2O e-commerce, includes both online and offline parts. Consumers obtain information and offers about products or services on the online platform, and then make reservations and payments through the online platform, while offline only focuses on providing services. The purchase process of consumers in the O2O model is generally divided into five steps.

(1) Phase 1: Drive traffic

Online e-commerce platforms bring consumers with needs together, or wake up consumers without needs all offline consumer needs and become the starting point for offline consumer decisions, general platforms include major map APPs, social applications, review sites, etc.

(2) Phase 2: Conversion

The online platform displays product information, store location, and product discount service details to attract consumers' attention and help them make comparative choices and finalize their consumption decisions.

(3) Stage 3: Consumption

After completing the decision, consumers use the details obtained in the online e-commerce platform for consumption and services in offline merchants.

(4) Phase 4: Feedback

After offline consumption is completed, consumers will upload their experience of this consumption to the online platform to help other consumers make their choices. At the same time, this information will also help merchants grasp users' ideas, better improve their products and services, and attract more consumers to use them.

(5) Phase 5: Retention

Through the data of users in the online platform, local merchants can maintain their old customers at any time, communicate with them, better understand their psychology, increase their stickiness, and make secondary consumption or even multiple consumption possible (Fig. 5.8).

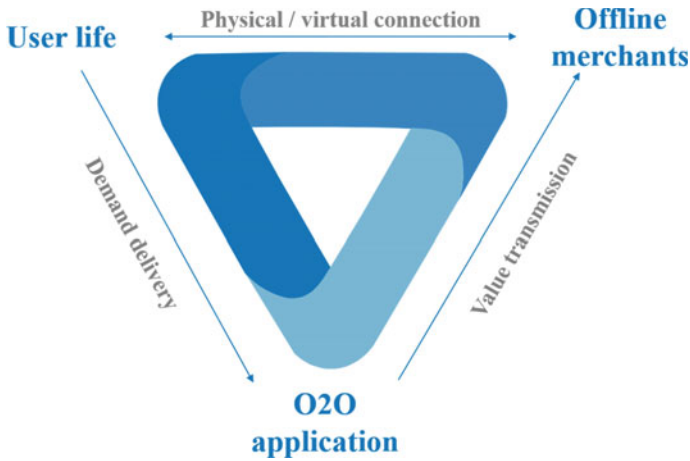


Fig. 5.8 O2O value model

3. Comparison of O2O e-commerce and other e-commerce models

O2O e-commerce is based on the brick-and-mortar store itself, online and offline at the same time, is an organic integration of the whole. O2O e-commerce is higher than other e-commerce models for consumption with service nature, such as catering, accommodation, and education. O2O e-commerce requires consumers to arrive at offline stores in person to obtain products or services, and cannot provide services that other e-commerce models have, such as home delivery. O2O e-commerce inventory is not about goods but about services.

5.4.2.5 Other New E-Commerce Models

In addition to the above traditional e-commerce transaction models, a series of new e-commerce models have been derived with the upgrading of consumer demand and the innovation and iteration of technology. From the perspective of e-commerce transaction participants, C2B and C2M e-commerce models are derived with the change of role status. D2C, BAB, and BUG e-commerce models are derived with the increase of participant types.

(1) C2B E-Commerce

C2B e-commerce model (customer to business) refers to the consumer-oriented business e-commerce this model will be a relatively disadvantaged group collection, through the number of enhancements to achieve the role of strengthening the right to speak, and ultimately gain more benefits. The C2B model strips the dominant, preemptive power of commodities from the hands of manufacturers. The right to speak is put into the hands of the consumer, and the shopping center format becomes a convergence of demand.

(2) C2M E-Commerce

C2M is the abbreviation for Customer-to-Manufacturer, which refers to the consumer-oriented factory e-commerce. This is a new type of industrial Internet e-commerce. In this model, consumers directly place orders to factories, which are designed and produced from scratch according to consumers' individualized special needs and finally sent to consumers. It mainly includes pure flexible production with fast supply chain response in small lots and multiple batches.

(3) D2C E-commerce

D2C (direct-to-consumer) refers to e-commerce where the producer and seller face the consumer. The central concept is a new e-commerce model in which consumers share their experience in using products and make interactive recommendations to get the benefits distributed by merchants. In addition to the general explanation, there are three other explanations of this e-commerce model, including Distribution to Consumer; DIY; and Designer to Customer.

(4) BAB E-Commerce

BAB (business agent business) is established based on the B2B e-commerce model, which emerged to solve the problem of mutual matching and mutual trust between trading companies. Create an honest trading environment with the trustworthiness of the platform, and then match the trading subjects with demand through big data matching, intelligent recommendation, data optimization, and other technologies.

(5) BUC E-Commerce

BUC (business to university to consumer) is a new e-commerce model that uses university e-commerce platforms as intermediaries to connect businesses with consumers. The biggest difference between this model and other e-commerce models lies in the middle group of university students.

5.4.3 From the Perspective of Goods

5.4.3.1 Front Warehouse Type E-Commerce

The front warehouse is a small storage unit set up close to the community location where consumers are concentrated. The seller delivers the products to this location in advance, and after the customer pays, the front warehouse manager organizes the packaging and completes the last mile of delivery.

5.4.3.2 Origin Warehouse Type E-Commerce

Compared to the front warehouse, the origin warehouse is larger in scale, which is a large enterprise to build a warehouse near the supplier's production area to facilitate

direct delivery into the warehouse. The setting of origin warehouse realizes high frequency and continuous replenishment in small lots, which can make logistics scale and save cost. It can improve the stock rate and shorten the ordering cycle. It can also optimize the stocking structure and improve the ability to respond to urgent orders, ultimately achieving a win–win situation for both buyers and sellers.

5.4.3.3 Sales Floor Warehouse Type E-Commerce

The sales floor warehouse e-commerce is to build warehouses in local markets, distribute products to local communities, and then complete transactions through consumer pickup or home delivery.

5.4.4 From the Perspective of the Field

The “field” refers to the network trading platform. On the basis of the two sides of the commodity transaction, the platform can be divided into the first party, the second party, and the third party.

5.4.4.1 First-Party E-Commerce Platform

First-party e-commerce means that the trading platform belongs to the seller (companies and merchants). Commercial transactions are conducted in the seller’s own online store, which does not depend on other e-commerce platforms for e-commerce activities.

5.4.4.2 Second-Party E-Commerce Platforms

The second-party e-commerce platform belongs to the buyer’s platform, that is, the buyer releases demand information through the platform, the seller can view and match the demand information through the platform, and communicate and negotiate with the buyer, and finally reach a deal.

5.4.4.3 Third-Party E-Commerce Platforms

1. Definition

The term “third party” means a party that exists independently of sellers and buyers and is referred to as a third party. A trading platform does not belong to either sellers or buyers. However, it brings together many sellers and buyers to market and

trade goods on it, and the platform party provides the platform and receives revenue. A third-party e-commerce platform, also a third-party e-commerce enterprise, is a service platform that is independent between buyers and sellers. It provides services to platform users according to the standards of services and transactions, including publishing information on buying and selling, information retrieval, placing orders, making payments, logistics and delivery, etc.

2. Features

The characteristics of third-party e-commerce platform include the following three. The first is independence. The third-party e-commerce platform is a third-party platform independent of sellers and buyers, and is a transaction marketplace connecting the two. The second is Third-party e-commerce platform is developed on the basis of e-commerce, so it must be covered by the network to function. The third is specialization. As an independent platform to provide various services for both sides of the transaction, it requires various professional management and service techniques.

5.5 E-Commerce and Common Wealth

5.5.1 *Theories Related to Common Prosperity*

“The way to rule a country begins with enriching the people”. General Secretary Xi Jinping stressed at the 10th meeting of the Central Finance and Economics Commission that common prosperity is the essential requirement of socialism and an important feature of Chinese-style modernization, and that it is necessary to adhere to the people-centered development ideology and promote common prosperity in high-quality development. On the new journey of building a modern socialist country in an all-round way, we must comprehensively and accurately understand and grasp its profound connotation and the path to its realization in order to solidly promote the common prosperity of all people.

5.5.1.1 The Connotation of Common Prosperity

1. The introduction of common wealth

On December 16, 1953, the Central Committee of the Communist Party of China adopted the *Resolution of the Central Committee of the Communist Party of China on the Development of Agricultural Production Cooperatives*. The resolution mentioned that “in order to further improve agricultural productivity, the peasants can gradually and completely get rid of their poverty and achieve a life of common prosperity and general prosperity”. The concept of common prosperity first appeared in the Party’s formal literature. Mao Zedong directly presided over and participated in the drafting

and revision of the resolution. Therefore, the concept of “common prosperity” can be considered to be initiated by Mao Zedong.

In March 1985, Deng Xiaoping pointed out in his speech, *The first depends on ideals and the second on discipline to unite* that “the purpose of socialism is for the whole country to be rich together, not polarized”.

On August 17, 2021, the tenth meeting of the Central Finance and Economics Commission formed the latest formulation for common prosperity, that is, common prosperity is the prosperity of all the people, the people’s material and spiritual life are rich, not the prosperity of a few people, nor is it neat and tidy egalitarianism, to promote common prosperity in stages.

To sum up, Xi Jinping’s Socialist Thought on Socialism with Chinese Characteristics in the New Era has further enriched and developed the theoretical connotation of common prosperity. Common wealth has distinctive features of the times and Chinese characteristics, which means that on the road of building a strong socialist modern country, all people, through hard work and mutual help, can generally achieve a rich and prosperous life, self-confidence and self-improvement, a livable and pleasant environment, social harmony and harmony, and universal public services, and realize comprehensive human development and social progress, and share the fruits of reform and development and a happy life.

2. The deeper meaning of common prosperity

(1) The common wealth is the common wealth of all people

In terms of the scope of common prosperity, common prosperity covers the entire population, and no one should be left behind. It is by allowing some people and some regions to get rich first, and then meeting the needs of the broadest number of people for a better life, so that all people can share the fruits of reform and development.

(2) Common prosperity is comprehensive prosperity

From the connotation of common prosperity, the ultimate purpose of common prosperity is not simply the enrichment of material wealth, but a multi-dimensional prosperity covering material, spiritual, cultural, ecological, social, public services, and other related fields. It is the comprehensive improvement of material civilization, political civilization, spiritual civilization, social civilization, and ecological civilization.

(3) Common wealth is to build and share wealth together

From the perspective of the path of achieving common prosperity, the realization of common prosperity will never allow the phenomenon of raising lazy people and waiting for others. Rather, it encourages all people to work hard and help each other. On the basis of everyone’s participation and everyone’s best efforts, we can realize everyone’s enjoyment, build a better home and share a better life together.

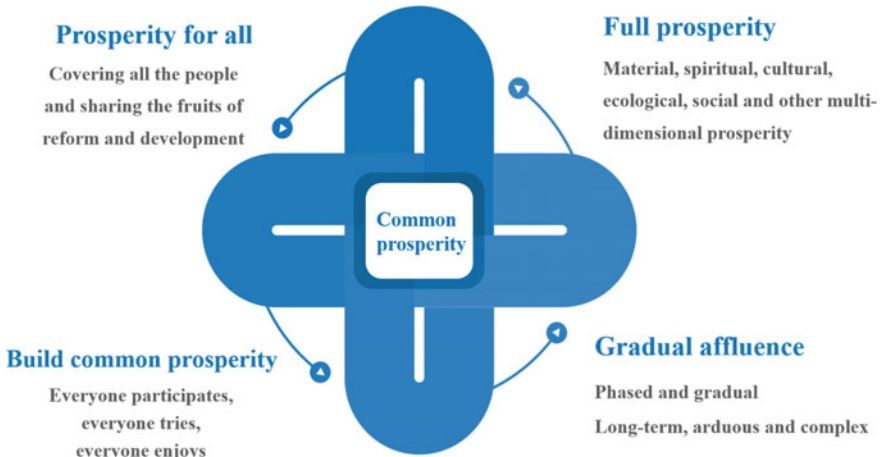


Fig. 5.9 The connotation of common prosperity

(4) Common wealth is progressive common wealth

In terms of the process of realizing common prosperity, the problem of unbalanced and insufficient development in China is still prominent. The disparity between urban and rural regional development and income distribution is large, so the realization of common prosperity is not a process that can be achieved overnight, but a phased and gradual process. This process is long-term, arduous and complex, and should be resolved gradually in the process of achieving modernization (Fig. 5.9).

5.5.1.2 The Path to Common Prosperity

In the process of promoting the construction of common prosperity, we should not only follow the law and be active, but also not be detached from the reality and raise the appetite, and we should do our best and act according to our ability, and pay attention to the prevention and resolution of major risks. To achieve the common prosperity of all the people, we need to implement the spirit of the Sixth Plenary Session of the 19th CPC Central Committee, forge a social consensus of common struggle, involve everyone, do our best, build and share together, and do the two major things of “making a bigger cake” and “sharing a better cake” at a higher level. To solve the problems of “affluence” and “common”. Common prosperity is achieved mainly through five major paths: common prosperity in high-quality development; common prosperity through diligent entrepreneurship and innovation; common prosperity through the promotion of all-round human development; common prosperity through the promotion of equalization of basic public services; and common prosperity through the optimization of the distribution system and policies.

5.5.2 E-Commerce Helps Common Prosperity

5.5.2.1 Rural E-Commerce Promotes Rural Revitalization and Empowers Common Prosperity

1. Discerning the relationship between rural revitalization and common prosperity

To reach common prosperity, the requirement is that the country's economic development reaches a high level, while the gap between different groups is controlled and gradually becomes smaller. In 2021, China's GDP per capita has surpassed the world's GDP per capita, reaching \$12,251, and is approaching the GDP per capita of high-income countries, and by 2025, China will cross the threshold of high-income countries. However, the goal of common prosperity is still focused on rural areas, and the data of 2021 shows that the income ratio between urban and rural areas in China is as high as 2.5, with unbalanced regional development, large income disparity, and no significant change in development pattern. Such a situation persists for a long time, and narrowing the gap between urban and rural areas is a challenge to be overcome in order to achieve common prosperity. Only by reducing the gap between urban and rural areas and achieving rural revitalization can we promote the common development of urban and rural areas and the common prosperity of the people.

2. The inner logic of rural e-commerce for rural revitalization

(1) Rural e-commerce to narrow the digital divide between urban and rural areas

In recent years, the government has strongly supported the development of rural e-commerce to promote rural revitalization, continuously increased the inclination of financial policies, and promoted the flow of technology, capital, talents, and other elements to rural areas through a series of measures to promote agricultural standardization, informatization and urbanization, realize the transformation and upgrading of industries in rural areas, accelerate the formation of rural Internet industries, promote the two-way integration of resources and elements between rural areas and urban areas, continuously narrow the digital divide between urban and rural areas, and promote the formation of a mutually beneficial and clear division of labor between urban and rural areas.

(2) Rural electric business to promote the revitalization of rural industries

Rural e-commerce is a huge driving force to push the rural economy forward. On the one hand, the emergence of rural e-commerce has transformed the original industries in the countryside and made them more diversified. Through the Internet, a huge connection channel, rural e-commerce connects small villages with large markets, breaking the time and space restrictions, opening up sales channels for farmers, and promoting regional brands of agricultural products. The management and sales of agricultural products are transformed into a network, converting the original individual farmer's special industries into local special industries and achieving economic development and farmers' income. On the other hand, rural e-commerce will give

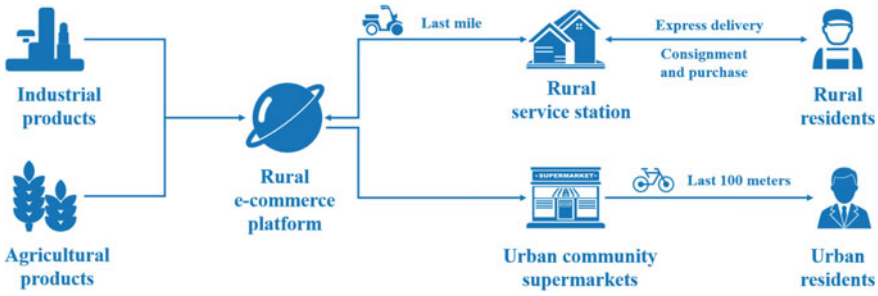


Fig. 5.10 Rural electric business through the “two-way channel”

rise to brand new industries and employment opportunities, such as processing and storage, logistics and distribution, artwork and photography, sales and customer service, etc. In addition, the maturity of rural e-commerce will accelerate the formation of rural Internet economic circle, drive talents to return to their hometowns for employment and entrepreneurship, and promote industrial revitalization and talent revitalization.

(3) Rural e-commerce to promote rural consumption upgrade

The emergence of rural e-commerce has brought great momentum to the innovation of rural consumption patterns and is an important vehicle to promote the development of the rural consumer economy. Rural people have increased their overall income and disposable income, so they also have greater spending power. At the same time, rural e-commerce has accelerated the construction of infrastructure and circulation systems, opening up channels for agricultural products upstream while also opening up channels for industrial products downstream, and exploding demand in the rural consumer market. More and more online business platforms aim at the rural sinking market, prompting rural consumption more convenient and choice space wider, realizing a win-win situation (Fig. 5.10).

5.5.2.2 Cross-Border E-Commerce Strengthens Regional Synergy and Empowers Common Prosperity

Common prosperity is a state based on the stage in which the economy and society are at the present time. For the time being, the common prosperity in China is based on the digital economy, the society and the common prosperity in the era of digital economy. As an important driving force to promote the development of our economy, as well as an important means to accelerate the transformation and upgrading of our industry, cross-border e-commerce, a new industry and new model to promote the synergistic development between regions, is a solid foundation for the realization of common wealth.

1. Cross-border e-commerce to promote the development of a shared growth approach

The importance of data is fully realized after entering the Internet era. Since the cost of producing data is so low as to be negligible, this has enabled data as a factor of production to break the limitations of a scarce factor of production and achieve the goal of driving sustained socio-economic growth. In the field of cross-border e-commerce, the application of data is even more important. Internet digital technology will be a perfect solution to the traditional business model of information asymmetry and the existence of barriers to resources, to achieve the sharing of the three streams between buyers and sellers, and then promote the shared growth of the business model, ultimately, to achieve the development of cross-border e-commerce and the realization of common wealth, mutual promotion of common development. [...].

2. Cross-border e-commerce reshapes the status of the original market relationship

There are huge differences between cross-border e-commerce and traditional business models, mainly in the market and employment relationship resources, dominant position, and other aspects of a huge breakthrough. These changes have created more employment opportunities for society at large, provided more platforms for practice, and in turn created more social value, making social wealth and social welfare increase to drive society into a new stage of development. Because of the inclusive and sharing characteristics of cross-border e-commerce itself, it also drives the transformation and upgrading of enterprises in traditional industries, which is consistent with the aim of common prosperity to solve the problem of imbalance and insufficiency, so we can say that the development of cross-border e-commerce provides a strong benefit for common prosperity, and therefore there is a strong fit between the two.

3. Cross-border e-commerce promotes mutual benefits and common development

Within China, cross-border e-commerce brings together enterprises from various fields, regions, and industries, breaking the time and space restrictions to participate in the production and consumption of cross-border e-commerce, further coordinating the relationship between urban and rural areas and industries, and making up for the differences between regions. On a global scale, the deep integration of cross-border e-commerce and the Belt and Road reflects the “Five Development Concepts” of Xi Jinping’s Socialist Thought with Chinese Characteristics for a New Era, joining hands with the Belt and Road countries to achieve mutual benefits and win-win results, and helping to achieve the goal of common prosperity.

5.5.2.3 New Forms of E-Commerce in the Digital Economy Drive Market Opening and Empower Common Prosperity

1. The specific connotations of new forms of e-commerce in the digital economy

With the development of the times and the progress of science and technology, the application of big data, artificial intelligence to promote the rapid development of e-commerce, and constantly generate new models of e-commerce different e-commerce models, but also gradually expand the application scene to all walks of life, all areas of life, all scenes, for the establishment of market relations, innovative business models, to accelerate economic growth has made an important contribution.

In the context of the digital economy, new forms of e-commerce include social e-commerce, live e-commerce, and community e-commerce, which take users as the core and reconfigure the three elements of traditional business: “people, goods, and fields” through information technology to form a new business model with the following three main features.

- (1) Shift from functional consumption to experiential consumption.
- (2) From product-centered to user-centered.
- (3) From single-scene integration to multi-scene integration.

2. The Inner Logic of New Forms of E-Commerce Empowering Common Wealth in the Digital Economy

Under the background of digital economy, the new situation of e-commerce has made fundamental sharing for the realization of common prosperity, mainly by incorporating the market relations of transaction subjects and related parties into the net chain, improving the fairness of primary distribution, using the results as the basis of secondary distribution, and significantly increasing the accuracy of secondary distribution to ensure social equity, thus promoting common prosperity.

- (1) New forms of e-commerce in the digital economy to strengthen the link between supply and demand

Due to the new situation of e-commerce in the digital economy, the time and space limitations are broken, the efficiency of matching supply and demand is increased, and the market individuals scattered in the market network are incorporated into the network chain and become a node in the network, making the market structure more stable and able to optimize the allocation of resources on a larger scale, thus coping with the uncertainty of market activities.

- (2) New forms of e-commerce in the digital economy close the factor access gap

The basis for the realization of common prosperity lies in having a fair and just market, and only in a fair and just market can all the distribution play its role properly. The new form of e-commerce under the digital economy starts from the fairness and openness of products, knowledge, and technology to narrow the gap of access to each element by all subjects in the market in order to build a fairer starting point and

thus create a fair and open market, which becomes the basis for the completion of common prosperity.

(3) New forms of e-commerce in the digital economy give rise to open innovation

The new form of e-commerce under the digital economy has made great efforts in each production factor, through which the whole supply chain of traditional industries from procurement to sales is fully penetrated, and the real economy and virtual economy are perfectly integrated. Based on the above-mentioned links, the connection between industries is strengthened and the whole society's industries are jointly upgraded, while efficient and inexpensive e-commerce applications lay the foundation for innovation. On the whole, the new form of e-commerce in the digital economy provides an all-round guarantee for the realization of common prosperity.

5.5.2.4 The Problems Faced in E-Commerce to Help Common Prosperity

1. Tax evasion problem

Taxes are the burden of the people and the income of the state. As an important means of secondary distribution, taxation objectively becomes a key lever to regulate the distribution of wealth between the government and citizens, and plays an important role in promoting common prosperity. In recent years, the national taxation authorities have increased the supervision of taxation of high-income people as well as high-income industries, and cracked down on all tax evasion and tax fraud in order to maintain the order of domestic taxation in China, and this series of measures has achieved positive results in China. However, at the same time, the methods related to tax evasion and leakage have been escalated with the strengthening of the crackdown, often with high concealment.

(1) Tax evasion in the field of live streaming with goods

As the taxation and regulatory mechanism in the field of e-commerce is different from traditional commerce, there are many loopholes, it is difficult to carry out thorough taxation checks on the authenticity of the volume transactions, unable to play the regulatory role of taxation policy, and unable to protect the legitimate rights and interests of consumers, not to mention the unification of online and offline, and the supervision of tax evasion is extremely difficult. Among them, due to the weak legal awareness of network anchors, the existence of fluke mentality and the lack of strict supervision in the industry, live with goods has become the hardest hit area for tax evasion. First of all, live with goods can quickly cash, tempted by the money part of the practitioners of the law is not deep, want to profit from hiding gray income, jeopardizing the security of the national tax. Secondly, live with goods anchor squid is dependent on the virtual network to get income, and no physical operation, coupled with the platform mechanism is not enough, sound supervision is not strong, leaving too many loopholes, resulting in tax regulation for anchors have the opportunity to take advantage of loopholes.

(2) Tax evasion problem management

For the problem of tax evasion, especially the governance of tax evasion in the field of live streaming with goods, joint actions between departments and information sharing between regions should be realized to carry out whole-chain governance and enhance the government's preventive, proactive and comprehensive regulation and governance of the internet celebrity economy. Incorporating information of all transaction subjects into the scope of supervision and forming a regulatory system by collecting government, industry, and platform, the government should revise the policy, cancel unreasonable preferential policies, and strengthen the filling of tax loopholes. The platform provides technical transformation to realize the functions of monitoring, early warning, approval, and processing, thus guiding the healthy development of the internet celebrity economy at all times. Industry self-regulation carries out tax-related policy propaganda to form a good taxation environment. In addition, capital regulation should be strengthened from the perspective of national security, and relevant laws should be introduced to regulate the capital, technology, and dissemination content of online platforms, support law-abiding and self-disciplined, high-quality, positive-energy web celebrities, and ensure that the web celebrity economy industry grows and develops in a healthy and orderly track.

At present, the State Internet Information Office, the State Administration of Taxation and the State Administration of Market Supervision and Administration jointly issued *the Opinions on Further Regulating the Profit-making Behavior of Live Internet Streaming to Promote the Healthy Development of the Industry*, clearly strengthening information sharing, deepening regulatory linkage, focusing on building a long-term mechanism for cross-departmental collaborative supervision, strengthening the normative guidance on the profit-making behavior of live Internet streaming, encouraging and supporting live Internet streaming to operate in compliance with the law, and effectively promoting the live Internet industry to regulate in development and develop in regulation.³

2. The problem of big data discriminatory pricing

In daily transactions, consumers have more or less experienced the following situations: when they want to buy a certain product, the price becomes higher and higher as they browse more and more times; new users enjoy lower prices and have more benefits than old users for the same product or service; when they book a product or service online, they find that the online price is higher than the price listed in the store when they actually go to the store; when they buy a product with a high-quality, high-priced cell phone model, the price is higher than with other ordinary cell phone

³The three departments jointly issued the "Opinions on Further Regulating the Profit-making Behavior of Online Live Broadcasting to Promote the Healthy Development of the Industry" [EB/OL](2022-03-31) [2022-04-01]. http://www.gov.cn/xinwen/2022-03/31/content_5682632.htm.

models ...These phenomena are known as big data discriminatory pricing, as they say, “the people who know you best can take advantage of your value”.

(1) The meaning of big data discriminatory pricing

Big data refers to information that is so large that there is no way to collect, process, and organize it using mainstream software or tools, and turn it into information that helps companies make better decisions. Big data has the following four characteristics: large data size, diverse data types, low value density, and fast data processing speed.

With the advancement of science and technology, big data is penetrating into every aspect of life and has become a mainstream trend that cannot be changed. But there are two sides to every story, and the widespread use of big data has also led to “abusive digital rights”.

Big data discriminatory pricing is a businessman collecting consumer information on the Internet through the application of big data, profiling and classifying consumers, and implementing price discrimination strategies against regular customers or customers who often buy their own products. That is, selling the same goods to familiar customers at a higher price, using the trust of familiar customers as a pedal to amplify their own benefits gained. This is a deliberate and deceptive behavior of merchants, which brings actual losses to consumers (Fig. 5.11).

(2) The danger of big data discriminatory pricing

Big data discriminatory pricing not only damages the legitimate rights and interests of consumers, but also violates the principle of fair and honest transactions. Under such circumstances, consumers’ trust in platforms and companies on the Internet has been greatly reduced, creating a massive crisis of trust. Companies and platforms facing such a situation are no longer focused on the improvement and innovation of the products and services themselves, but through such means as capital and information technology to obtain more profits, disregarding the rules of the market resulting in a waste of resources. Therefore, big data discriminatory pricing has to a certain extent undermined the stability and affluence of the whole society and become a resistance to the destruction of common prosperity.

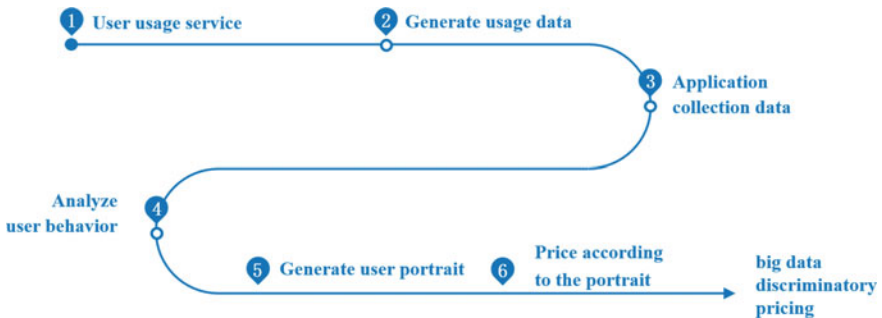


Fig. 5.11 Steps of big data discriminatory pricing

(3) The governance of the problem of big data discriminatory pricing

The governance of big data discriminatory pricing problem should start from many aspects, both to play the market forces, but also to enhance the regulatory capacity and institutional safeguards.

First, strengthen policy and institutional oversight. On January 4, 2022, the State Internet Information Office announced the adoption of the “*Internet Information Service Algorithm Recommendation Management Regulations*”, which came into effect in March of the same year, limiting the use of algorithms to control the recommended content on the one hand, making it mandatory for platforms and businesses to comply with the rules on the use of big data. On the other hand, it protects people from being addicted to the Internet because of the algorithm, and also avoids the phenomenon of big data discriminatory pricing because of high daily consumption, which also has obvious constraints on the phenomenon of big data killing.

Second, clear data rights boundaries. Operators should clearly inform users and regulators of the scope of data collection, the means of data collection, the purpose of using data, etc. so that users have sufficient understanding of how their information is used and how it is accessed. At the same time, the regulatory authorities should regulate the use of personal information by operators, requiring operators not to use personal information for price differentiation and so on.

Third, promote algorithmic transparency mechanisms. Regulators should guide companies to manage algorithm ethics by incorporating them into corporate regulations, thereby reducing the number of cases in society where algorithms are being used where they should not be.

Fourth, market dominance should be curbed. Consumers should quickly switch to other platforms after noticing such behavior as platform discriminatory pricing, so as not to give such companies and platforms the opportunity to become dominant in the market.

3. Platform “pick one of two” monopoly problem

E-commerce born in the network environment has obvious network externality compared with traditional commerce. The positive feedback effect generated by the externality makes the marginal utility of e-commerce platform increase with the growth of customers, so the transaction cost of customers in larger e-commerce platform is much smaller than that of smaller e-commerce platform, and the existence of scale economy also makes such larger e-commerce platform more attractive, forming the Matthew effect and even possible monopoly. In e-commerce, the most common is the platform “pick one of two” problem.

(1) The meaning of “pick one of two” platform

The “pick one of two” is an abuse of dominant market position and constitutes a limited transaction, which means that the platform requires merchants to enter into a contract that allows them to choose only one platform to operate and participate in activities, and generally such a platform has a dominant market position and therefore merchants are dependent on it.

(2) The dangers of “pick one of two” platform

The problem of “pick one of two” platform has completely destroyed the fair order of competition in the market and is a manifestation of disorderly expansion of capital. Such behavior has forcibly created barriers to competition, and at the same time curbed the development of innovation and hindered the upgrading and iteration of technology and optimization of products and services. In addition, the rights and interests of business operators and all consumers are compromised, and even losses are incurred, greatly reducing social benefits. Finally, the “pick one of two” behavior will not only affect the welfare of consumers, but will even be transmitted to the entire industrial chain, which will have an impact on the overall economy and reduce the efficiency of economic operation. Under the guidance of common prosperity, Internet platforms should take up their responsibilities and obligations after receiving the dividends brought by the first distribution.

(3) Governance of the “pick one of two” problem on the platform

The Anti-Unfair Competition Law, the E-Commerce Law, and the Anti-Monopoly Guidelines for the Platform Economy provide comprehensive assistance in solving the “pick one of two” problem. In 2021, the state began to pay attention to the problem of “pick one of two”, put forward the need to strictly regulate this problem, and held a related press conference. It was pointed out at the conference that anti-monopoly and vicious competition should be strengthened, and that unfair competition such as platform second-choice should be severely punished. And issued the *Guiding Opinions on Giving Full Play to Judicial Functions to Assist the Development of Small and Medium-Sized Enterprises*.⁴

However, from an overall and long-term perspective, the governance of the platform “pick one of two” problem needs to adopt a three-tier governance structure of law, policy, and society. On the basis of state regulation, social regulators should also regulate the industry order, promote the formation of self-regulatory behavior of enterprises, and build new methods, new models, and new channels for governance.

5.6 Summary of this Chapter

The essence of e-commerce is commerce, and the core of commerce is the transaction of goods. Regardless of which existing e-commerce model, its core role is still as a platform to connect the supply side and demand side, to promote the rapid achievement of the transaction. On the one hand, because e-commerce is a sales channel, transaction is a necessary function, and with “transaction”, e-commerce products can be transformed into e-commerce goods, and the flow from the production side to the

⁴ The Supreme People’s Court issued the Guiding Opinions of the Supreme People’s Court on Giving Full Play to the Role of Judicial Functions and Helping the Development of Small and Medium-sized Enterprises [EB/OL](2022-01-14) [2022-04-01]. <https://www.court.gov.cn/zixun-xiangqing-341901.html>.

consumption side can begin. On the other hand, the extended functions all need to reach a transaction as a prerequisite for realization.

In the process of e-commerce transactions, clarifying the operation process of e-commerce transactions is an important way to stimulate the vitality of e-commerce transaction subjects. Precisely identifying the types of risks in the process of e-commerce transactions and preventing them is an important guarantee to ensure the standardization and orderliness of e-commerce transactions. On the basis of the existing basic model of e-commerce, continuously strengthening the interaction of the three elements of “people, goods, and fields” and innovating new forms, models and modes of e-commerce is the only way to accelerate the high-quality development of e-commerce in China, increase the contribution of e-commerce to the common wealth, and thus move towards a strong e-commerce development country.

5.7 Post-Lesson Exercises

1. Briefly describe the specific connotations of initial distribution, secondary distribution, and tertiary distribution.
2. Briefly describe the initiatives related to the distribution of data production factors.
3. Briefly describe the four links in the transaction process and analyze the difference between traditional business transaction links and e-commerce transaction links.
4. Analyze the difference between e-commerce and traditional commerce in terms of commodity flow mechanism.
5. What are the types of risks in e-commerce transactions? What are the specific elements included? And give examples to analyze.
6. Talk about your understanding of e-commerce risk prevention and list the specific measures.
7. From the perspective of channels (networks), into which categories can e-commerce transaction models be classified?
8. Briefly describe the similarities and differences of B2B, B2C, and C2C e-commerce models.
9. Briefly describe the operation process of O2O e-commerce model.
10. Talk about the new e-commerce models you know.
11. Briefly analyze the difference between front warehouse, origin warehouse, and sales floor warehouse.
12. Briefly analyze the similarities and differences of first-party, second-party, and third-party e-commerce platforms.
13. Talk about your understanding of the connotation of common prosperity.
14. Analyze the transmission mechanism of rural e-commerce to promote the achievement of common prosperity.
15. Analysis of the transmission mechanism of cross-border e-commerce to promote the achievement of common wealth.

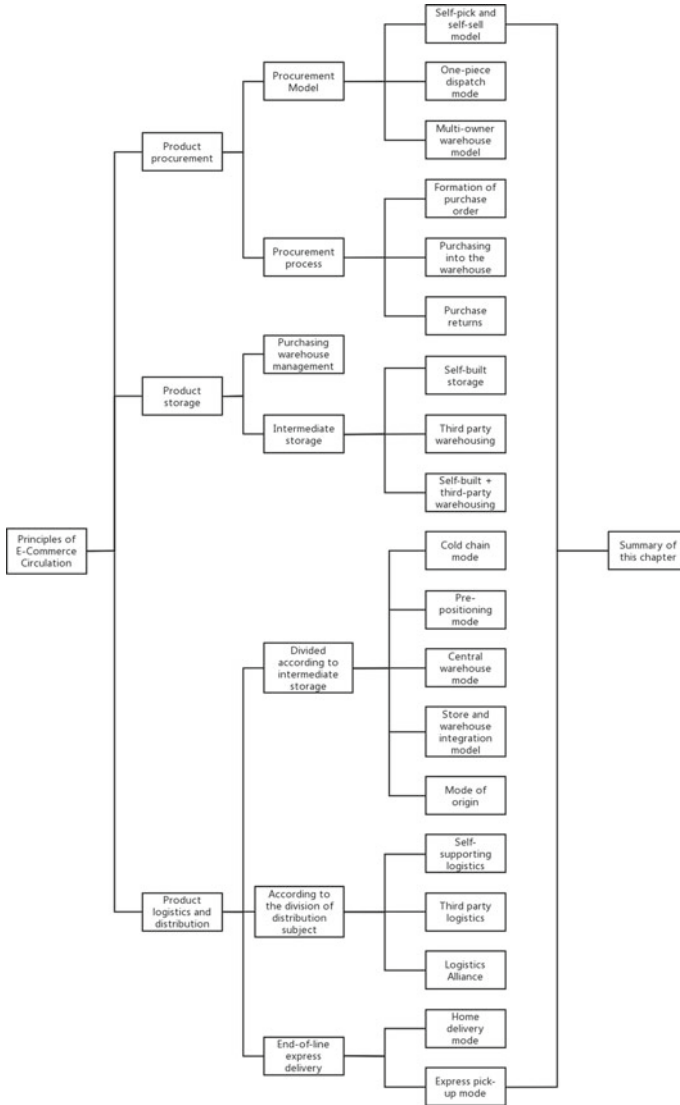
16. Analysis of the relationship between new forms of e-commerce in the digital economy and the role of shared prosperity.
17. Talk about your understanding of big data discriminatory pricing and platforms “pick one of two”, and think about how to solve such problems.

Chapter 6

Principles of E-Commerce Circulation



Knowledge Map of this Chapter



Take Charge and Continue to Promote the Construction of a Three-Tier Logistics System

Around the Ministry of Commerce and the other 17 departments “on strengthening the construction of county commercial system to promote rural consumption opinions” and other policy documents, China Post will continue to fully

implement the construction of a county and village logistics system to promote the quality of rural consumption expansion.

(a) Adhere to the overall planning, and systematically promote the construction of a three-tier logistics system

China Post will follow the “four unified” principles of unified planning, unified standard, unified brand, and unified system, and take “two centers and one site” (county center + township center + village site) as the main construction mode to further improve the three-tier logistics system. China Post is committed to building an open, shared, intelligent and fast postal logistics system for counties and villages, and improving the last-kilometer delivery capacity. By the end of 2021, complete the first batch of 417 key demonstration counties’ and cities’ three-tier logistics system construction; strive to use 2 years to complete the national three-tier logistics system construction. Rely on postal delivery, rural e-commerce, inclusive finance, and other business resources to create a collaborative service model of China Post to help rural revitalization.

(b) Highlight key areas, and comprehensively enhance the service capacity of the three-tier logistics system

First, optimize the rural network architecture. The government takes county, town (town branch) and village stations as three-level nodes, and adopts the network mode of “county + town + village station”, “county + town”, and “county + town branch + village station” to build the foundation of the county service network. Second, strengthen the construction of three-level nodes. Strengthen the hub node function of county-level center, promote the integration of processing center and storage center construction, according to the needs of local industrial development coordinated planning and construction of cold chain storage; implementation of “postal in the countryside” “courier to the countryside” gear upgrade project, promote the township post offices, express network standardization, and information transformation, strengthen the township center in the three-tier logistics system in the county and township postal road and delivery line junction, post and express cooperation on behalf of the collection and delivery of the function of the handover point; construction of village-level “comprehensive convenience service station”, relying on the village post station, post and shopping station, integration of village committees, convenience service stations, and other existing resources, to achieve multi-station unity. Enhance the comprehensive service capacity of the end nodes. Third, enhance the network service capacity. Optimize the postal routes in counties and villages, and adopt the combination of “own + commission office + cooperation of delivery and postal services” to improve the operational efficiency of postal routes; optimize the organization of delivery operations, and through “radiation from county-level centers”, “radiation from township

centers”, “radiation from township branch offices”, and “radiation from county-level centers”. Optimize the organization of delivery operation, and enhance the frequency of delivery in key towns through three modes of “radiation from county-level centers”, “radiation from township centers”, and “radiation from township branch offices”; optimize and integrate delivery lines, increase capital investment, and introduce subsidy policies to promote the automobilization of rural delivery. Fourth, promote “traffic and postal cooperation” and “postal and fast cooperation”. Combined with the General Office of the Ministry of Transport issued the “2021 work plan to promote the integration of rural passenger, cargo and mail development”, the government should promote the integration of postal express and rural passenger, and freight operations. Expand the scope of post and express cooperation, to create a postal rural infrastructure network as the main body of the county-level common distribution platform, all-round enhance the county and village levels of private express delivery capacity, the formation of farmers benefit, and “post” “fast” win-win situation. The Government is satisfied with the virtuous cycle.

(c) Build the operation system and comprehensively create a comprehensive service model for postal benefit to farmers

First is to create a comprehensive service platform to enhance the equalization of basic public services in rural areas. Based on the concept of “open sharing, superimposed empowerment and ecological establishment”, the company will improve the service ecology of “outlets + sites” and create a “universal service” + “inclusive finance” + “rural e-commerce” + “postal and fast cooperation” + “governmental services for the people” + “agricultural cooperation” transformation model of “universal service + 5”. Second is to create a service system for the benefit of agriculture, and focus on cracking the “three difficult” pain points. For agricultural and rural “financing” “sales” “logistics” pain points, play the importance of postal “three streams in one” advantage, build the “government + postal + new agricultural business entities” for the agricultural service system, for the new agricultural business entities to provide a set of rural finance, rural e-commerce, agricultural products delivery, and agricultural capital and agricultural technology as one of the integrated service solutions. Focus on helping farmers’ cooperatives to develop with high quality and promote the integration of small farmers into the modern agricultural development pattern. Third is to improve the production and marketing docking system and serve the development of agricultural industries with special characteristics. Around the characteristics of local agricultural industries, strengthen the layout of China Post’s agricultural product base, complete the construction of 150 agricultural product bases nationwide in two years, start building “origin warehouses” and “sales warehouses”, and dock “field warehouses”. Strengthen the brand empowerment of agricultural products, establish the whole process of quality control and traceability system of agricultural products through social

cooperation, smooth the pathway of branded agricultural products from the field to consumers, shorten the intermediate links, and help farmers increase their income. Fourth, strengthen the supply of rural financial products and services to inject fresh water into agriculture and rural areas. Implement the spirit of the document of the People's Bank of China on the demonstration project of financial technology empowering rural revitalization, accelerate the implementation of the digital transformation plan of the Bank of China Postal Savings for three rural finance, and promote the construction of a digital inclusive financial ecology; strengthen credit product innovation, focus on the important subjects of rural revitalization, and take the construction of credit villages and supply chain finance as the hands to continuously provide good financing services; promote the construction of rural credit system, and improve and promote the construction of rural credit system, improve the data platform of "three rural areas", actively connect with the platforms of rural government, rural public payment, rural "three assets", and rural property rights trading, and do a good job of integration, governance, and application of "three rural areas" data; and promotes the development of direct marketing bank and digital RMB pilot, and makes every effort to promote the construction of scenarios of financial technology-enabled rural revitalization.

Reflections:

1. What substantial impact will the construction of the three-tier logistics system have on rural life?
2. Which aspects are still needed to promote rural revitalization?

Source China Post Group Corporation "Build a three-tier logistics system, build a postal ecology for farmers, and create a special service model for China Post to help rural revitalization".

The principle of e-commerce circulation is mainly to solve the timeliness between production and consumption.

"Circulation" is an economic concept, which refers to the whole process of exchanging commodities from the production field to the consumption field, the purpose of which is to realize the "value exchange" and "physical exchange" of commodities through circulation. The purpose is to realize the "value exchange" and "physical exchange" of goods through circulation.

By its nature, the trade and distribution industry is a tertiary industry. In a broad sense, the commerce and distribution industry encompasses the sum of all trade relations among commodity owners and collects commercial flow, logistics, information flow, and capital flow, including wholesale, retail, catering, logistics, information, finance, etc.; in a narrow sense, it only refers to the four industries of wholesale, retail, catering, and logistics. E-commerce, as a mode of commerce, is an individual in the system of commerce and circulation. Under the support of the three basic elements

of information flow, logistics, and capital flow, there is an interaction between e-commerce and commerce and circulation. In the process of China's rapid economic development, there are also distinctive regional differences; in the trade circulation industry, the application of information technology for e-commerce can be used to improve the quality of inter-regional transactions, while the regional economy has the characteristics of uneven development; it can make full use of this advantage, a reasonable layout of the scope of business, to enhance the level of industry, and in turn for the development of e-commerce services. Therefore, the relationship between e-commerce and the trade circulation industry is complementary and supportive of each other. E-commerce has the potential to promote the development of trade circulation, therefore, e-commerce circulation is a reflection of trade circulation in the field of e-commerce. Referring to the broad and narrow definitions of the trade distribution industry and the process of product circulation, e-commerce circulation can be divided into three links: product procurement, product storage, and product logistics and distribution in order.

6.1 Product Procurement

From the perspective of the operation mode of e-commerce enterprises, the source of goods of traditional enterprises is mostly products produced by the enterprises themselves, while the goods of mainstream e-commerce-based enterprises often come from procurement. The procurement process of e-commerce is the process of ordering goods from suppliers initiated by procurement business personnel, based on procurement, in order to have the subsequent business about goods warehousing, returns, sales, logistics, etc. Therefore, procurement is the first link to e-commerce circulation. In an e-commerce enterprise, the role of the procurement system is to determine when to purchase, from whom to purchase, at what price, and when to receive goods and other procurement matters based on the enterprise's demand for goods. For e-commerce companies, a good procurement system can help them shorten the lead time for ordering, reduce inventory levels, save costs, ensure normal sales and event promotions, and improve service quality. Unlike manufacturing enterprises, suppliers of e-commerce companies have not only traditional commodity suppliers but also virtual commodity suppliers, resellers, and other multi-type suppliers, which have different strategies for conducting procurement business. Here, we only analyze the supply and procurement of physical goods.

Generally speaking, the procurement system mainly includes the business aspects of supplier management, purchase order management, procurement inbound management, and return management.

6.1.1 Procurement Model

In the e-commerce industry, there are three main common procurement models: self-pick and self-sell model, one-piece dispatch model, and multi-owner warehouse model. Among them, the self-pick and self-sell model and one-piece dispatch mode are the most common.

6.1.1.1 Self-pick and Self-sell Model

The self-sourcing model means that the goods inside the e-commerce company's own warehouse are not produced by itself, but are purchased through suppliers, and then displayed and sold in its own online store or website. In this model, the seller has ownership of the goods after buying them. This model is similar to traditional wholesale, requiring e-commerce companies to make bulk purchases, and many suppliers do not support single-piece purchases, so the capital requirements for the purchase of goods is very large, and will bring the risk of inventory backlog.

6.1.1.2 One-Piece Dispatch Mode

With the development of technology and social progress, compared with traditional shopping, consumers prefer online shopping; the number of online stores on various shopping platforms is huge, and competition is intensifying. Therefore, only rapid delivery, quality control, and stable, high-quality sources of goods can continue to meet the needs of agents, and shorting the product purchase link is imperative. So the "one-piece delivery" business model was born. It is a very common model with the self-pick and self-selling model.

Specifically, this model means that once the platform has sold the goods, it is not the platform but the supplier who is responsible for delivery and then settling the goods and logistics costs according to the order. Strictly speaking, this model does not only involve the procurement process but also cover the delivery of the products. Compared with the self-sourcing model, the seller in this model does not own the goods. The actual supply and demand relationship is between the supplier and the buyer who has the demand for the goods. The supplier will display the key information such as the style and color of the goods on the webpage, and then promote it to the buyer who has the demand through the search engine.

In one-piece delivery mode, the supplier will deliver the goods after the consumer orders. The network operators do not need to build their own warehouses to store goods, so this model not only saves the cost of goods inventory but also effectively avoids the accumulation of goods and cannot find the sale of the situation. And, one piece of hair cleverly avoids the disadvantages of the traditional wholesale model. The traditional wholesale model has certain restrictions on the quantity and amount of goods, but in the one-piece delivery model, even if only one piece can be

shipped. In addition, the price of goods online is becoming increasingly transparent; the purchaser of the online store can more easily “compare three”, then select the most appropriate price and quality of the purchase channel. For newcomers to the e-commerce store, the operation of this store is very simple. They just register an account in the platform and provide the supply manufacturers with product images and descriptions, and do not need to spend energy on product information early.

However, the one-for-one model may lead to sellers being stuffed with suppliers’ backlog inventory, thus taking risks. Moreover, with the gradual transparency of information on the network, the one-piece dispatch model, which uses the information gap to earn a price difference, will gradually lose its advantage in the price and quality selection of goods. Unknown variables such as the choice of suppliers and changes in the signing of agreements may dilute the original model of stable sources of goods and good quality control of the advantages, but bring risks in this regard.

6.1.1.3 Multi-owner Warehouse Model

Multi-master warehouse mode specifically refers to that the logistics head office opens the warehouse to the supplier, and when the supplier’s goods enter the warehouse, they belong to the ownership of the supplier’s goods. Compared to the first two models, the multi-owner warehouse model is less common, but the characteristics of the model determine that it has more room for development in the future.

This model originated from the needs of small and medium-sized e-commerce enterprises. Such platforms need to build warehouses at the end of each distribution in the country if they want to ensure logistical efficiency, but this is a matter that requires extremely high costs and a very long time. This level of resource investment is enough to drag down small and medium-sized e-commerce companies. And the advantage of the multi-shipper warehouse model is that it can solve the problem of small and medium-sized e-commerce companies due to the construction of warehouses and the funds generated by the purchase of goods to enhance the ability to control the end of sales. For the head of the open warehouse logistics company, they can make full use of the idle storage capacity and rent it out for cash, thus realizing the mutual benefit of logistics companies and e-commerce platforms.

6.1.2 Procurement Process

6.1.2.1 Formation of Purchase Order

The procurement of goods marks the beginning of e-commerce distribution, and all procurement actions revolve around purchase orders.

Purchase order number: XXXXXX

Status: Waiting for arrival Providers: XXXXXXXX	Storage: XX Purchaser: XXX	Purchase Date: 20XX-XX-XX Procurement type: general procurement
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Serial number	SKU Subjects	SKU Barcode	SKU Name	Brand	Specification	Unit price with tax	Quantity	Tax rate	Amount with tax
1									
2									
3									
Total						Purchase quantity: XXXX Purchase amount: ¥XXXX			

Estimated arrival time: 20XX-XX-XX Invoice type: VAT special invoice Prepayment: ¥XXXX	Delivery method: delivery to warehouse / logistics delivery Payment method: XXXXX Remarks: XXXXX	Delivery Address: XXX Payment cycle: cash on delivery / monthly settlement
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Fig. 6.1 Example of a typical purchase order

First, the e-commerce business department according to the enterprise’s own needs in the procurement system fills out the procurement plan, the procurement plan through the approval of the procurement clerk will be sent to the supplier procurement quotation, and the supplier then sends their own mind feedback quotation to the procurement clerk; through such a process, a regular agreement price implementation will be put in place; after that, the procurement clerk will finalize the purchase price recorded in the purchase order. Once the above work is completed, the e-commerce business will officially begin to purchase goods. A typical purchase order includes information such as warehouse, SKU, quantity, demand time, applicant, and remarks, as shown in the following Fig. 6.1.

Purchase order is the core of procurement, so the procurement process also revolves around the purchase order. The purchase order unfolds in SKUs and the main process can be divided into six steps as follows.

- (1) The business party requests a purchase order and fills in the purchasing information. Then the audit department reviews and submits the purchase order, and if the audit does not pass, the purchase order is rejected and re-edited; if the audit passes, it flows to the next step.
- (2) Merchants and suppliers finalize purchase details and sign purchase contracts.
- (3) The dispatch center generates purchase entry orders, dispatches them to the warehouse, and generates purchase entry orders in the warehouse management system.
- (4) After the purchase is physically warehoused, the warehouse management system will generate the physical entry order, and the dispatch center will update the purchase order and inventory according to the physical entry.
- (5) Some goods will be stocked in batches. After all the goods are stocked, the financial system will generate the purchase statement and flow the settlement in the financial system.

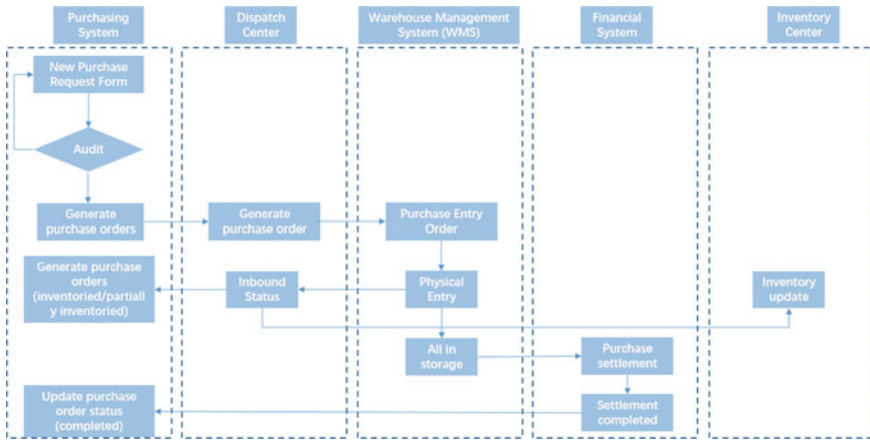


Fig. 6.2 Purchasing process

- (6) After the settlement is completed, the status of the purchase order in the business system is updated accordingly and changed to completed (Fig. 6.2).

In the procurement process, we first make a procurement plan based on safety stock, procurement lead time, order point, order quantity, and other factors, and then create a new purchase request order based on the procurement plan. The safety stock in the procurement plan is the stock set to prevent uncertainty in procurement (such as quality problems of products), and the procurement system will generate an early warning or generate a purchase order to automatically replenish the stock when it is lower than the safety stock. From the generation of purchase orders to the purchase of physical warehousing, there is a certain procurement cycle in between, and the length of the cycle will affect the management of procurement and warehousing. The order point and order quantity are mainly related to the demand, and the procurement system can decide when to order and how much to order based on the forecast of the demand.

The above process is the formation of a single purchase order; in addition to individual orders, you can also place purchase orders in bulk. In this case, the system will split the orders according to the dimension of suppliers and warehouses, and distribute them to each supplier and each warehouse.

6.1.2.2 Purchasing into the Warehouse

When an order is placed in the purchasing system and then approved, the information will be synchronized to the Warehouse Management System (WMS) to generate the corresponding purchase entry order. At the same time, the purchasing staff should send the purchase list to the supplier and indicate the key information such as the

name, specification size, quantity, and arrival time of the purchased goods in the list to facilitate the subsequent process management.

The supplier sends out the goods needed by the purchaser according to the requirements on the purchase list. When the goods are delivered to the destination, the warehouse personnel have to verify the actual quantity of goods received according to the purchase list and then verify whether the quality of the goods is qualified or not. Generally speaking, when the quantity of goods is relatively large, the quality of goods will be checked by means of random inspection. If there is any problem with the quantity or quality of this batch of goods, the warehouse staff must reflect the problem to the purchasing supervisor the first time, and the purchasing supervisor will then negotiate with the supplier side on the handling method.

After the treasurer confirms that the quantity of goods is correct, the inspector checks the goods according to the incoming material standards and handles the warehousing procedures for the goods that meet the standards, and prohibits the entry of goods that do not meet the standards. After all the goods are warehoused, the purchaser, the warehouse manager, the inspector, and the vendor need to sign on the incoming order to confirm. When all incoming orders show “Received or Completed”, the result of warehousing will be uploaded to the business system, the incoming purchase orders will be settled by the finance department for payment, and the status of the orders will be shown as “Completed”.

The goods need to be tagged before they are put on the shelves in the warehouse. SKU is the unique identification code of the goods in the system, which can not only help the system identify the goods but also simplify the subsequent selection and delivery process. The shelf clerk can scan the warehouse code and commodity code to confirm the number of shelves and update the inventory in the warehouse according to the warehouse recommended by the system.

6.1.2.3 Purchase Returns

The entire procurement process consists of two main processes, namely the forward procurement of incoming goods as described earlier and the reverse procurement of returned goods to be introduced. The occurrence of returns is a very normal phenomenon, which is the process of e-commerce enterprises returning some goods to suppliers. Specifically, the enterprise will make returns in the following three cases: First, the enterprise received the goods on the existence of problems and did not pass the quality inspection of goods; in this case, there are problems with this part of the goods that can be rejected not to do inventory processing; second, the consumer received the goods with quality problems; third, the goods that do not sell.

First, the warehouse needs to confirm that the goods can be returned to the processing, and then through the status of the goods “positive to disabled” or according to the goods of the warehouse to adjust the information back to the purchasing clerk. Then, the procurement staff according to the information received create a new purchase return order (or the warehouse department can directly use the SCM system to create a new return order). After the business internal audit, the

return order is synchronized with the “supplier and merchant management platform”, and after the platform audit, it is synchronized and uploaded to the WMS system for return operation, and then the WMS will send the return inventory details back to the SCM system, and the upper system deducts the inventory, and finally the system generates the receipt and release order according to the release details. The flow of documents is similar to purchase order.

6.2 Product Storage

6.2.1 Purchasing Warehouse Management

After the procurement process, we have to manage the storage of the purchased goods.

The core object of the purchasing behavior is the Stock Keeping Unit (SKU), and the purchase price and inventory are the most critical reference factors for the SKU. Purchasing is an action within the purchasing system related to suppliers; inventory is an action within the e-commerce WMS related to the warehouse. Therefore, in the procurement system, the data displayed in the list of purchased items are mainly SKU’s category, barcode, name, brand, specification, unit, real-time cost, and overall inventory. Broken down, the price data of the supplier dimension are mainly SKU information, supplier, agreed price, recent purchase price, historical price, etc.; the inventory data of the warehouse dimension are mainly SKU information, warehouse, warehouse stock, available stock, in-transit stock, cycle demand, etc. (Fig. 6.3).

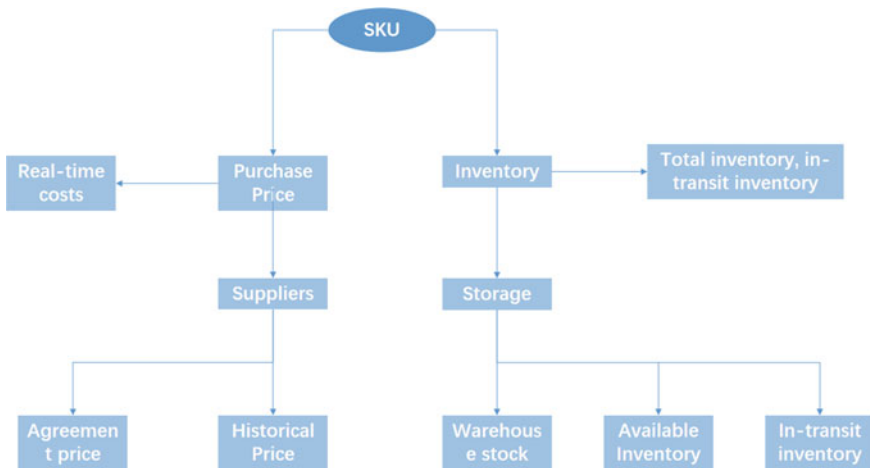


Fig. 6.3 Purchasing product list display data

Serial number	Warehouse	Warehouse Inventory	Available Inventory	In-transit inventory in 3 days	In-transit inventory	The last 1 month out of the warehouse volume
1	Beijing Storage	1500	1400	200	200	3000
2	Shanghai Storage	800	750	0	100	1500
3	Hangzhou Storage	500	420	400	450	1000
4	Wuhan Storage	600	590	100	600	2000
					

Fig. 6.4 Example of purchase inventory order

Since the purchased SKUs must go to specific warehouses, the purchasing staff needs to know the inventory of each warehouse. The stock information of specific SKUs is shown in Fig. 6.4, where the stock that has been placed but has not yet arrived in in-transit stock, and since some of the in-transit stock can be sold as pre-sale stock on the front end, we have listed the 3-day in-transit stock separately, but the consumers must be informed in advance of the delivery time of this part of the product.

6.2.2 Intermediate Storage

After the purchase of goods into the warehouse, in the e-commerce circulation process in the middle of the distribution, the circulation process has not only an important role in the intermediate storage, both manufacturers and e-commerce enterprises to study the focus of planning, but also an important link in the modern e-commerce circulation. Efficient and reasonable warehousing helps manufacturers to improve the speed of material flow, reduce costs and ensure smooth production; and makes e-commerce enterprises improve the efficiency of goods distribution, to achieve effective control and management of resources.

According to the ownership of the warehouse, the intermediate storage of circulation can be divided into three models: self-built storage, third-party storage, and self-built + third-party storage.

6.2.2.1 Self-built Storage

Self-built warehousing means that companies store their products in their own warehouses. In this mode, the enterprise has absolute control over the material handling equipment and the construction of the warehouse. If a company requires a high degree

of autonomy in warehouse operations and a high degree of stability in product storage conditions, self-built warehouses are indeed a good choice.

The e-commerce company has ownership of the warehouse and can design the warehouse system according to the product characteristics of its own business, so it can better understand the state of the warehouse and can effectively coordinate the relationship between the warehouse and other systems, thus improving the efficiency of operational management. In addition, because the self-built warehouse can be used for a long time, according to the theory of economies of scale, the cost of storage per unit of goods can be reduced. And products stored in its own warehouse, to some extent, can reflect the strength of the enterprise, and can give customers a good impression of the strength of the enterprise, and stable and reliable operation, which helps to improve the competitive advantage of enterprises.

But enterprises need to invest a lot of human, material, and financial resources to build their own warehouse, compared with other storage methods of high investment costs. And no matter how the demand for storage space, warehouse capacity is fixed, and cannot be expanded or reduced with the increase or decrease in demand. When the enterprise demand for storage space is reduced, enterprises still need to bear the cost of the unused part of the warehouse; and when the enterprise has additional demand for storage space, the warehouse cannot meet, it can be seen that the internal movement of self-built warehousing flexibility is poor. Similarly in the external aspects, the flexibility of the location of the warehouse also has problems. If companies can only use self-built warehouses, they lose the flexibility to strategically optimize the location, because the number of warehouses is limited and the location of space is fixed. The size of the market, location, and customer preferences all have a major impact on whether an e-commerce business can survive in the marketplace, and if it cannot adapt to these changes in warehouse structure and services, the business will miss out on many business opportunities.

6.2.2.2 Third-Party Warehousing

Third-Party Warehousing, also known as contract warehousing, refers to e-commerce enterprises that will be warehousing logistics activities subcontracted out, by the cooperation of external company enterprises to provide comprehensive logistics services warehousing method.

Compared to the traditional leased warehouse model, third-party warehousing is designed at a higher level, allowing for a higher level and specialized storage that can better meet the storage requirements of certain special commodities (such as biological drugs that are very sensitive to temperature requirements), in addition, third-party warehousing can also provide efficient, economical, and accurate specialized distribution services. In essence, third-party warehousing is a partnership between e-commerce companies and professional warehousing companies. Unlike traditional warehousing companies, the third-party warehousing model can provide shippers with storage, loading and unloading, consolidation, order picking, on-site

inventory, transportation allocation, transportation management, information, and other integrated logistics services required by shippers.

The resource utilization rate of third-party warehousing is much higher than that of self-built warehouses. The third-party warehousing model can more efficiently handle the off-season and peak-season storage issues typical of seasonal producers and improve the utilization of warehousing facilities and space. At the same time, the management experts of third-party warehousing companies have more innovative distribution concepts and master more ways to reduce costs, and therefore subsequent logistics efficiency is higher. Moreover, the third-party warehousing model is able to receive large quantities of goods from different shippers at the same time and can be transported on a large scale in consolidated containers, which saves transportation costs to a large extent. Because of the simultaneous processing of goods belonging to different owners, this “scale effect” compared to self-built warehousing is more efficient. In addition, e-commerce platforms generally require more time and manpower to set up distribution facilities to open up new markets, but by using third-party warehousing networks, e-commerce companies can use such short-term third-party warehousing to explore the market demand for their products when promoting them, thus achieving their goals more quickly.

Although third-party warehousing has the above-mentioned advantages, it also has some inevitable shortcomings. Compared to self-built warehousing, e-commerce companies using the third-party warehousing model have no ownership of the warehouse and no control over logistics activities. In addition, the operation of the warehousing process of the enterprise for the hired staff control is also less, for which the total value of goods and high e-commerce enterprises and the risk of damage to goods in transit will increase.

6.2.2.3 Self-built + Third-Party Warehousing

This comprehensive model is a combination of the above-mentioned self-built warehousing and third-party warehousing model, that is, partly self-managed, partly outsourced out, and the two models can be switched at any time. Using this hybrid model of e-commerce enterprises in the production or storage of goods often has special requirements, such as personalized assembly and sub-warehouse multi-zone location.

E-commerce companies in the hybrid model can reduce the number of their warehouses to single digits and outsource the logistics of each region to third-party warehousing. This combination of free warehousing and third-party warehousing helps companies reduce direct labor costs and expand their market reach while retaining direct control over centralized warehousing facilities.

6.3 Product Logistics and Distribution

The development of the e-commerce economy and the circulation of e-commerce are closely related to the mode of logistics. Logistics, as part of the supply chain, originally means “physical distribution” or “distribution of goods”, and is the process of planning, implementing, and controlling the efficient and low-cost flow and storage of goods and services from the origin to the consumption end in order to meet the needs of customers. It is the process of planning, implementing, and controlling the flow and storage of goods and services from the origin to the consumption end in order to meet the needs of customers.

E-commerce logistics, also known as “online logistics”, is a new business model based on Internet technology, which aims to promote the innovative development of the logistics industry. It brings together the world’s largest logistics needs of shippers and logistics service providers, and establishes a neutral, fair, and free online logistics market, helping logistics supply and demand sides to trade efficiently. Logistics and distribution of e-commerce products is an important part of the e-commerce circulation system, an important carrier for expanding domestic demand and promoting consumption, and an important link between domestic and international markets. Promoting the high-quality development of product logistics and distribution is conducive to linking production and consumption on a larger scale and improving the overall operational efficiency of the national economy.¹

6.3.1 Divided According to Intermediate Storage

In the new retail context, e-commerce platforms strive to achieve accurate and fast delivery of products, focus on intensive development, and pay more attention to consumer demand and satisfaction. According to the type of warehousing and the distance between the warehouse and the consumer, logistics models can be divided into five categories: cold chain model, central warehouse distribution model, front warehouse model, store-warehouse integrated model, and origin model.

6.3.1.1 Cold Chain Model

Cold Chain Logistics refers to the logistics and distribution mode in which the products are always under the specified low-temperature environment during production, storage and transportation, sales, and all the links before consumption to ensure quality and reduce loss. This mode has higher requirements for refrigerated and frozen equipment, and the corresponding management and capital investment is also larger than the ordinary room temperature logistics, which is suitable for some

¹ The Ministry of Commerce and other nine departments issued a document to speed up the construction of a new recycling system, supporting the construction of green sorting center.

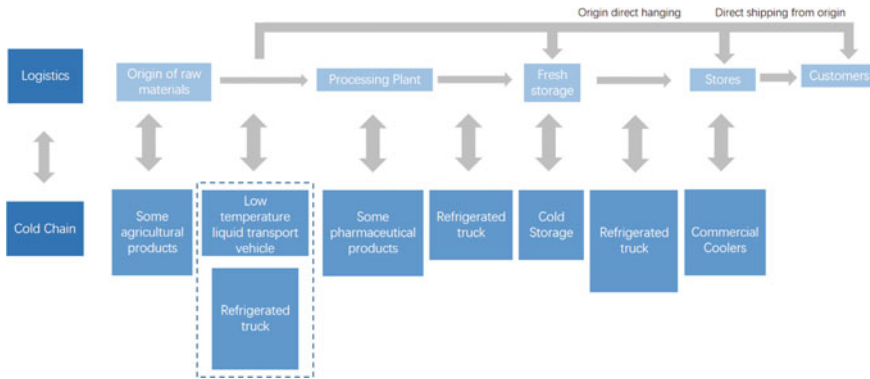


Fig. 6.5 Cold chain logistics transportation system

commodities with higher and more complicated requirements than the general room temperature logistics system, such as primary agricultural products, processed foods, and drugs. The warehouses of e-commerce companies that adopt the cold chain logistics model, self-owned warehouses, and third-party warehouses are far away from consumers in terms of physical distance. When a customer places an order, the own warehouse or third-party warehouse will choose a professional cold chain logistics company to deliver the food to the customer in the form of cold chain packaging.

The “14th Five-Year Plan” of the “Outline” clearly pointed out that the construction of a modern logistics system accelerates the development of cold chain logistics and improves the backbone of the cold chain logistics base facilities conditions. In the 13th Five-Year Plan period, the state issued a series of policies to support the development of the cold chain logistics industry, such as the “Notice on the First Batch of National Backbone Cold Chain Logistics Base Construction” and “Opinions on Promoting the High-Quality Development of Logistics to Promote the Formation of a Strong Domestic Market”.²

(1) Cold chain distribution process

In the upstream of the cold chain logistics model, the products are kept in low-temperature cold storage, refrigerated trucks, and other professional refrigeration equipment to ensure the quality of these special products. In the midstream of the cold chain commodity circulation, the products will go through the steps of dry transportation, loading and unloading into storage, and refrigerated preservation, all of which are carried out under refrigerated and frozen conditions. After this, these goods will enter the downstream stores, be stored in commercial coolers, or directly mailed to the downstream consumer end (Figs. 6.5 and 6.6).

² China Business Industry Research Institute, the national provinces and cities of the cold chain logistics industry "fourteen five" development ideas summary analysis.

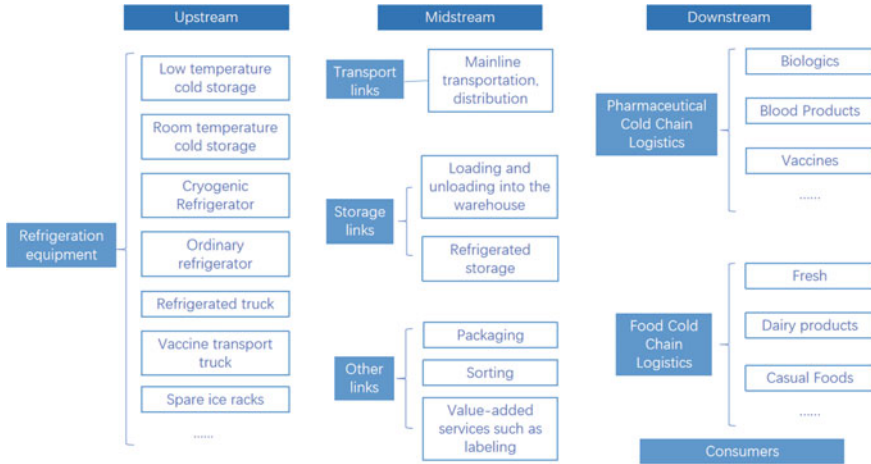


Fig. 6.6 Cold chain logistics process

(2) Characteristics

From the nature of cold chain logistics transportation of goods and other aspects, the characteristics of cold chain logistics mainly include the following points.

① Perishability of goods

The goods using cold chain logistics mode are mostly fresh products and pharmaceutical products with high requirements on temperature and storage conditions, such as fresh fruits and vegetables, and biological drugs, which are often perishable and poorly resistant to storage. Improper control of temperature conditions will lead to the growth of microorganisms on the surface of cold chain goods and produce a certain degree of damage to the goods.

② Delivery timeliness and coordination

Due to the special nature of the products delivered via cold chain logistics and the high-quality requirements of consumers, the longer the goods are in transit, the greater the risk of deterioration. Therefore, cold chain logistics requires more preparation time than general commodity logistics. Cold chain logistics requires coordination, close cooperation, and comprehensive arrangements among all parties to ensure the quality of the goods while minimizing logistics time and improving customer satisfaction.

③ High cost of distribution

The high cost of cold chain logistics is mainly reflected in the following three aspects. Firstly, due to the special characteristics of cold chain distribution products, the logistics system must invest in professional cold chain equipment, such as cold storage and refrigerated trucks, which means high initial investment costs; secondly,

energy consumption is very high because cold chain products must be stored in a strictly defined low-temperature environment throughout the transportation process. Thirdly, compared with traditional logistics products, products that require cold chain transportation during the circulation process will incur costs for natural damage of goods due to their perishability, which will also lead to higher costs.

④ High professionalism in distribution equipment

The cold chain logistics distribution process requires professional equipment and professional technology to ensure a low-temperature environment throughout the cold chain products in circulation, such as professional refrigerated vehicles, special temperature control devices, and advanced logistics information technology. The high professionalism of logistics equipment can also lead to huge expenses in the whole distribution process.

(3) Application

Compared with the traditional ambient temperature logistics system, cold chain logistics is more demanding, more complex, and has higher capital expenditure, which is a huge system of engineering. Usually, this model is applicable to goods sensitive to temperature changes, and it is common in life for fresh food e-commerce in the integrated platform category (Fig. 6.7).

The brand started building a cold chain logistics system in 2014 and introduced it in 2018 to supply fresh and medicinal products. Based on the “three-one” integrated service function of a cold chain storage network, cold chain delivery network, and cold chain distribution network, the brand has become a cold chain service platform with core products, and science and technology. In addition, the brand has also established a one-stop cold chain service platform with F2B2C processes and scenarios to realize secure payment between goods and consumers. In terms of cold chain storage, the brand has 10 dedicated cold storage facilities across the country, covering a deep

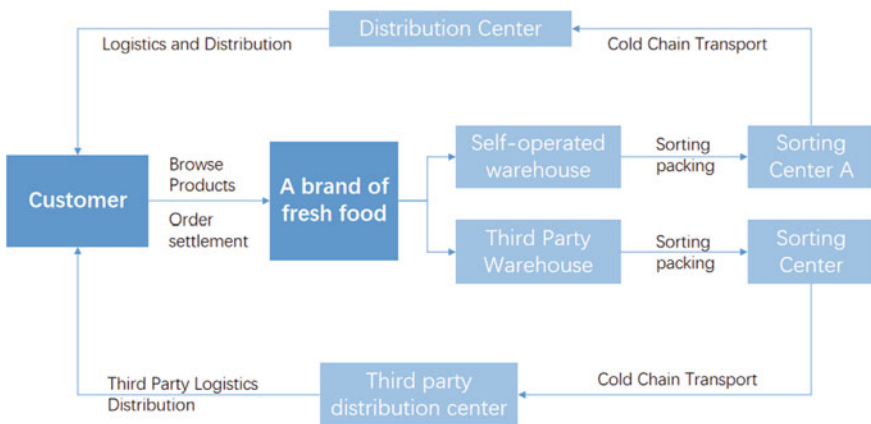


Fig. 6.7 Cold chain logistics of a domestic e-commerce company

freezing layer of $-30\text{ }^{\circ}\text{C}$, a freezing layer of $-18\text{ }^{\circ}\text{C}$, and a cold storage layer of $0\text{--}4\text{ }^{\circ}\text{C}$. The temperature and humidity in each temperature zone are monitored and managed in real time to fully guarantee the quality of the goods during delivery. After launching the “211” delivery service in core cities, the brand also launched the “Night Delivery” service from 10 to 7 pm and the “Precision Delivery” service for delivery within 2 h. These services have improved the delivery time and efficiency of fresh products in all aspects.

Generally speaking, the traditional order flow is approximately as follows: warehouse-picking center-customer. But the brand’s fresh food transportation process is different. The brand has established a mobile storage model based on the distribution network, and then the “inventory front”, also known as the mobile order flow, which brings the distance between consumers and goods closer, improves delivery efficiency, and achieves “hourly delivery” for the best-selling category. This fresh food mobile warehouse model not only effectively enhances customer experience and improves customer attention and interaction on site but also further consolidates the brand’s fresh food competitiveness at a high level. The cold chain integrates cold chain warehousing, cold chain city distribution, and freshness express as one, which brings convenience and efficiency to freshness transportation and delivery.

6.3.1.2 Pre-positioning Mode

Front-end warehouse is a logistics and distribution model developed by e-commerce companies to improve distribution efficiency. This model takes the form of small storage units at the end of the supply chain and replaces traditional distribution centers with a large number of distributed small warehouses in order to better shorten the distance between consumers and storage.

(1) Front warehouse distribution process

The front warehouse will be positioned according to the community to select and build a warehouse, and conduct a circle within about 5 km to cover the surrounding communities to ensure that it can deliver goods to consumers within two hours. First, rely on data analysis and own supply chain resources (such as cooperative origin, and city batch market and brand suppliers) to select suitable goods, distribute to the city sorting center for product testing, and then transport these standard products to the front warehouse for small warehouse stocking after steps such as packing and grouping orders. At the same time, a logistics team is set up to briefly assemble the short-stocked goods after consumers place orders, and deliver the goods from the front warehouse to consumers within 2 h. Compared with traditional distribution centers, front warehouses are usually closer to consumers, which allows the supply chain network to sink further (Fig. 6.8).

(2) Characteristics

As a new storage mode, the front warehouse can achieve efficient distribution while ensuring the quality of fresh food with its advantages. The central warehouse, as a

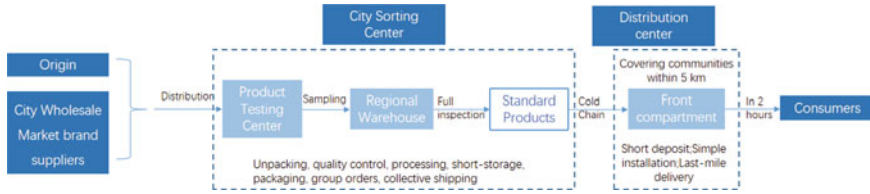


Fig. 6.8 Chain in front position mode

traditional mode of storage, is mainly used for centralized distribution. Fresh products will be transported to the distribution center in each city through the central warehouse, and then transported to consumers by the distribution center.

For cost reasons, central warehouses are often located in suburban areas far from the city center, with long shipping distances, making it difficult to meet consumer demand in terms of speed of delivery. To address these drawbacks, front-end warehouses were developed.

In the front warehouse mode, consumers place orders directly on the fresh food e-commerce platform, and the products are picked up and packaged directly from the front warehouse for delivery. This is because the merchants have delivered the products to the front warehouse near the local community in advance according to the demand of the surrounding consumers.

It has high degree of digitalization and accurate prediction of end-user demand. The front warehouse is not only the last link point in the whole supply chain to reach users but also the closest distributed operation center and data center to users. The continuous progress of big data analysis and intelligent algorithms draws a clearer portrait of consumers, predicts more accurate traffic, and operates the supply chain through traffic as the core, making more accurate commodity procurement and more timely adjustment of commodity categories and quantities.

6.3.1.3 Central Warehouse Mode

Central warehouse, also known as central warehouse, is a traditional logistics concept and belongs to the first layer of the logistics system. It can be divided into the central distribution center CDC and the regional distribution center RDC. Central distribution center refers to receiving multi-species and high-volume goods from suppliers, and then delivering the complete goods to logistics companies or designated organizations according to demand through storage, sorting, distribution and distribution processing, information processing, and other operations.

The central warehouse is usually located close to the origin or supplier to facilitate the aggregation of products for outbound distribution. According to the location of the corresponding customer base, the second level of the logistics system after the regional warehouse or city warehouse is possible. With the rapid development of e-commerce and the regulation of the express industry, many platforms will adopt

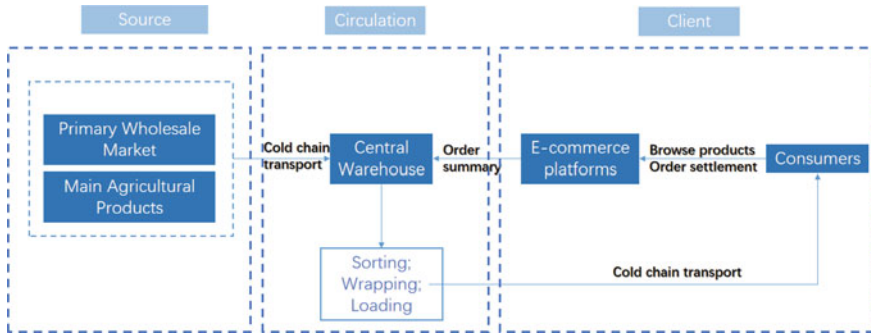


Fig. 6.9 Central warehouse model flow

the logistics system of factory direct delivery and origin direct sales; in a broad sense, such factory warehouses and origin warehouses can be called “central warehouses”.

(1) Central warehouse distribution process

After the consumer places an order, the central warehouse will collect the order, and then the goods will be transported from the source end (for example, the primary wholesale market and the main production area of agricultural products) to the central warehouse at the distribution end. In the central warehouse, the products needed for each order will be sorted, packed, and loaded, and the orders will be aggregated and then aggregated, packed, and sent out in a unified manner during the selected time period, and finally transported to the consumers (Fig. 6.9).

(2) Characteristics

① Smaller input cost

Front warehouses are generally laid out near neighbourhoods, while central warehouses often choose to be built in the suburbs, so the rent will be less. In addition, a central warehouse has a large area, generally one in an area is sufficient, and there is no need to build many like front warehouses.

② Low staffing

The central warehouse is characterized by small quantity and large area, and it does not have the function of business. Therefore, in terms of staff allocation, fewer staff are needed than the pre-warehouse mode, and the expenditure on staff wages is slightly smaller.

③ Concentration of operation time period

The central warehouse usually goes to the unified processing of customer orders at a fixed time, and the distribution is also unified. Although there will not be a long delay, fresh food and medicine have high requirements for order response speed and

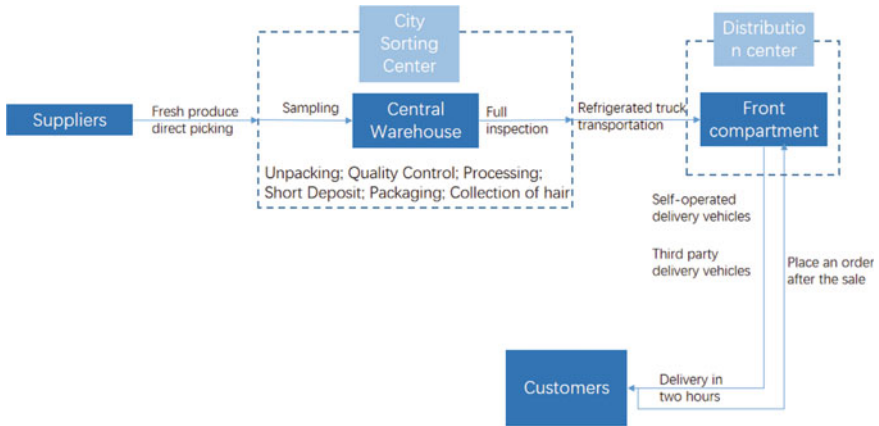


Fig. 6.10 Flow of central warehouse + front warehouse model

delivery speed of goods, so the central warehouse is obviously not competitive in this kind of market.

(3) Application of central warehouse + front warehouse model

Take a domestic fresh food e-commerce company as an example; the products will be stored and distributed through suppliers, central warehouse, and front warehouse in turn, and finally delivered to customers in a relatively short time (Fig. 6.10).

① Supply from suppliers

First, the central warehouse forecasts and develops a purchase plan based on available inventory and sales, and initiates a purchase request to the supplier. The supplier makes timely delivery by air, land, and sea under appropriate conditions as requested by the central warehouse.

② Central warehouse storage and distribution

The staff of the central warehouse will randomly inspect the fresh products received, and only the accepted food products can be stored in the central warehouse. After the inventory system of the front warehouse sends a replenishment order to the central warehouse, the central warehouse will quickly organize the complete inspection, release, and distribution of the relevant food products, and use refrigerated trucks to deliver the fresh products to the front warehouse.

③ Front warehouse storage and distribution

Once the fresh products arrive at the front warehouse, the front warehouse staff will check and store these products. When the consumer places an order, the staff will quickly sort the products according to the order information, and the products that pass the quality inspection will be delivered by self-operated or third-party delivery personnel.

④ Consumer order and after-sales

After consumers select goods on the platform, if they are not satisfied with the goods received, they can apply for a return or exchange within the time specified by the platform, provided that the goods meet the return criteria of the platform. After submitting the return application, the front warehouse staff will actively respond to the customer’s needs and promptly process the returned goods.

6.3.1.4 Store and Warehouse Integration Model

The store-warehouse model, i.e. the “in-store + at-home” model, promotes the integration of online and offline development by virtue of its store-centric features, and cultivates consumers to develop the consumption habit of placing orders online and picking up goods offline. The stores mentioned here play the role of mini-supermarkets as well as storage centers for online delivery.

(1) Store and warehouse model process

Under the store-warehouse integrated mode, suppliers can directly supply to offline stores. The “warehouse” in this mode is different from the traditional logistics mode. It reduces the rent, labor input and operation investment of the warehouse. In the case of online to home, consumers select goods and order through the e-commerce platform, and generate orders after the offline shop store warehouse for the packaging and delivery of goods, quickly to the hands of consumers. In the offline-to-store mode, consumers go directly to the store for shopping; they can get direct processing services. This store warehouse is different from the single delivery to home and offline shopping, so we can say that “online to home + offline to store” enriches the consumer’s buying experience (Fig. 6.11).

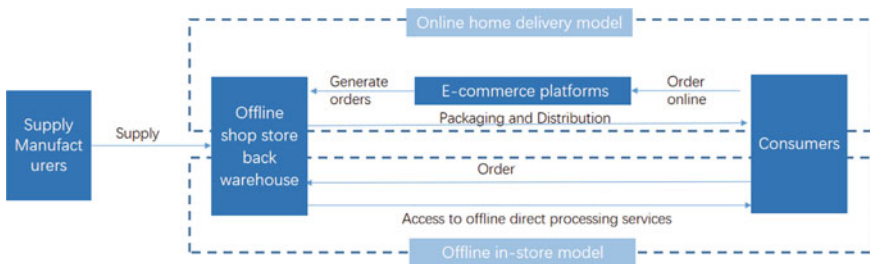


Fig. 6.11 Flow of store-warehouse model

(2) Characteristics

① Meet the demand for timely delivery

The integration of the store and warehouse mainly serves consumers within 1–3 km of the surrounding area. The offline store as a small warehouse can achieve very fast delivery of products; the transport time is basically within 30 min, which ensures the high quality of fresh products and meets the dual needs of consumers for product quality and timely delivery, bringing consumers an excellent shopping experience. In addition, offline stores give consumers a true sense of the shopping environment, product quality, and service quality, which helps to enhance consumer trust and improve consumer retention and repurchase rates.

② Online and offline mutual attraction

The store-warehouse integration model is a combination of Internet-driven and offline store experiences. For online users, products that can be purchased online are displayed in offline stores, and then online users are more willing to go to offline stores for self-pickup in order to understand whether there is a difference in product quality and quality control between online and offline sales, thus realizing the import of online users to offline. And through the guidance of service personnel and the attraction of activities such as membership, consumers who love offline shopping can be precipitated. The full coverage of users in both online and offline channels reduces the cost of customer acquisition for online stores and brings traffic to offline stores, achieving a win-win effect.

③ Data-based operation

Compared with traditional superstores, the store-warehouse integration model has more online shopping channels, and also allows a better grasp of consumer demand online. By aggregating online store orders and collecting shopping information such as consumers' cell phone numbers, customer unit prices, and recent purchases, the platform can analyze consumers' recent shopping tendencies. For example, for recent hot-selling products, offline stores can change the way they display goods and place them in more prominent locations to further increase product exposure; and for products that are not selling well, they can take the form of bundled sales with hot-selling products and drive sales by offering a combination of discounted prices. This can help the platform to get close to consumers, wirelessly approaching their inner needs, so as to target more accurate marketing activities.

(3) Application

A pioneer of a new domestic retail superstore is a typical model of store-warehouse integration. The retailer has created an integrated online and offline new retail model that not only meets the needs of consumers shopping in-store but also provides consumers with various additional leisure and entertainment activities to improve the overall shopping experience of consumers.

Any product that consumers see in the store can be found in the online store at the same price and quality as the offline product, which is in line with the “what you see

is what you get” mentality of consumers. In addition, users visiting the brand’s offline stores will be invited to install an app, which will make it easier for offline consumers to order online, thus introducing a closed-loop consumption model of offline experience and online ordering. In order to eliminate barriers to offline and online interface, the brand will also combine online and offline product management, including information on prices, promotions, and points for all products, through electronic tags and other means, forming a closed loop of online and offline consumption, while achieving omnichannel sales.

As of 2020, the brand has more than 200 stores nationwide, serving more than 10 million consumers and operating stores for more than 1.5 years with average daily sales exceeding 800,000 for a single store, fully confirming the feasibility of the store-warehouse integration model.

6.3.1.5 Mode of Origin

The origin model, i.e. the origin warehouse model, is to set up a warehouse near the producer of the origin of the product and do direct delivery for the manufacturer or brand, thus making the logistics-intensive and large-scale logistics model, which is different from the ordinary logistics model of multi-level distribution.

This origin-direct distribution model can unify many independent links in sales logistics and realize the integration of logistics links between goods from producers to consumers. Products from the origin are transported to the origin distribution center via industrial agricultural companies, agricultural cooperatives of origin, and other agencies on their behalf. The distribution of goods passes through the logistics center warehouse and the retail terminal, and finally reaches the consumer. In this process, the origin warehouse is very close to the origin, and far from the consumer, which is set to ensure the quality assurance of the products in the “first kilometer” of transportation. This model is mainly for third-party e-commerce channels. With the increase in the share of online sales, the origin model has slowly become part of the brand focus on the development of logistics methods (Fig. 6.12).

Logically, the origin warehouse model is exactly the opposite of the front warehouse: in terms of physical distance, the origin warehouse is farther from the end of the distribution and closer to the origin; in terms of service object, it is converted from serving customers to serving origin suppliers; the supply chain is continuously extended upstream and is more inclined to supply-side logistics optimization.

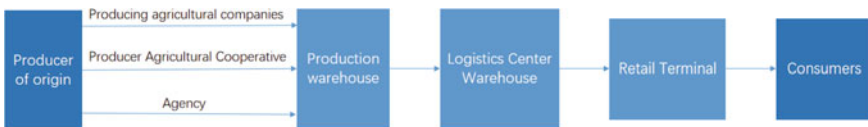


Fig. 6.12 Flow of origin model

Because the origin direct mode is not traditionally handled by distributors for sales and logistics, but by manufacturers directly, small batches and multiple batches directly to the client, which is a more realistic response to consumer demand, record all consumption scenarios and help the supply side to understand the end, more in line with the principle of flexible production.

(1) Characteristics

The origin warehouse model brings many benefits to all parties in the supply chain.

For upstream suppliers, this model can realize multi-frequency and small-lot continuous replenishment from the origin warehouse to the distribution center and forwarding center, shorten suppliers' billing period and order lead time, optimize stocking structure, and improve spot rate, improve the ability to handle urgent orders, increase suppliers' sales, and improve customers' time-efficient experience. At the same time, the proximity of origin warehouses to suppliers also reduces logistics costs.

For the downstream e-commerce platform, due to the location characteristics of the origin warehouse, in-transit inventory will increase, safety stock can be reduced thereby reducing stagnation, the inventory area of e-commerce companies can be reduced, and the spot rate can be improved. And multi-frequency small-batch replenishment improves the frequency of supplier delivery and reduces the inventory turnover days. In terms of operation management, the platform can know the future arrival of goods in advance, reduce the difficulty of receiving goods, improve the efficiency of receiving goods, and reduce the cost of the warehouse and upstream and downstream communication.

(2) Application

In 2020, China will achieve full victory in the battle against poverty and promote rural revitalization in 2021, which is a historic shift in the focus of the work of the three rural areas. To promote rural revitalization, we must solve the problem of storage and preservation of agricultural products from the source, guarantee the "first kilometer" of agricultural products out of the village, consolidate and expand the achievements of poverty eradication and rural revitalization, and enhance the modernization level of the rural industrial chain supply chain.

For farmers whose main income comes from the sale of agricultural products, it is crucial to do a good job in the "first mile". The application of the origin warehouse model can make agricultural products transported out in time, not rotting in the ground, and reduce product loss. At the same time, the origin warehouse connects the planting side and the production side, improves the agricultural conversion rate through modern information technology, realizes the digital production and standardized planting of agricultural products, and allows the order agriculture model to greatly help farmers.

The pioneer brand of domestic e-commerce retail has tried to optimize and upgrade the "first mile". The application of the origin warehouse connects the two ends of supply and production, and combines digital technology to build a more efficient warehouse and distribution system. At the planting end, the brand has given its

partner bases and farmers planting and picking standards, and through digital system monitoring and guidance, it ensures that the planted produce is of high quality and reduces losses. At the supply chain end, through the cold storage of bases, cold chain logistics of radiation bases and origin warehouses, the quality of agricultural products is stabilized while grading standards are established for each kind of agricultural product, thus truly achieving superior prices.

6.3.2 According to the Division of Distribution Subject

According to the actual process of logistics operation of e-commerce enterprises, the logistics of e-commerce products mainly includes the logistics transportation stage as well as the terminal distribution stage.

When a customer places an order, the system will send the order information to the warehouse nearest to the consumer, which will complete the packing and delivery of the goods. The goods will first be delivered to the city distribution center where the warehouse is located, and then the distribution center will agree to deliver the same city destination express to the distribution center in the target city. In the end distribution stage, the distribution center will make a delivery plan to deliver the express goods to the customer according to the customer's service requirements (such as time constraints).

In the process of product delivery from the warehouse to the hands of customers, according to the distance of distribution, logistics belongs to the long line and takes up most of the distance in circulation. According to the difference of the main body that carries out logistics distribution, i.e. the operator of distribution, the logistics of e-commerce can be divided into three categories: self-operated logistics, third-party logistics, and logistics alliance distribution.

6.3.2.1 Self-supporting Logistics

Self-operated logistics refers to the enterprise's own logistics business, building a wholly owned or holding logistics subsidiary to complete the enterprise's logistics and distribution business, that is, the enterprise itself to establish a set of logistics systems. The main economic source of this type of enterprise is not in logistics, but has the ability to undertake its own logistics business and make profits from it.

In the mode of self-operated logistics, the logistics department of e-commerce enterprises or their own logistics enterprises are responsible for all links, including the self-established logistics distribution center, terminal self-service points, organization of express vehicles and delivery personnel. This is a complete system, from upstream commodity supply, procurement, transportation, and storage to downstream commodity warehousing, transportation, and distribution, which requires the inter-connection of all links of e-commerce enterprises and requires more manpower and

capital investment, further testing the overall layout of the network structure and decision-making process of express enterprises.

(1) Self-operated logistics advantages

The characteristics of e-commerce companies owning their own logistics services give this logistics model a unique advantage, with competitiveness in terms of control, corporate capital flow, transaction costs, and brand value.

① Hold the control

E-commerce companies that adopt the self-managed logistics model have the most detailed information about the performance and specifications of their internal procurement and sales chain goods, the supplier's supply quality, and the platform's operational capabilities. This information can therefore be used to effectively coordinate all aspects of logistics activities, to solve logistics management problems more quickly, and to obtain the most timely information from suppliers and end customers to adjust their business strategies at any time. For example, companies can set the location of their warehouses based on various relevant factors and deliver orders and other information to the warehouse within the shortest distance from the consumer. Strong control plays an important role in improving logistics efficiency.

② Activation of assets

Companies that choose to operate their own logistics find it easier to transform their business management structure and original logistics resources, thereby increasing the flow of capital and creating greater profits for the company.

③ Reducing transaction costs

In the self-managed logistics model, the company has complete and real information about the logistics service provider because there is no information asymmetry. E-commerce companies can make full use of their own management of all-selected control of the purchase and sale of goods, without having to spend human and financial resources to negotiate for warehousing, transportation, distribution, and after-sales service issues, thus avoiding multiple transaction costs and largely reducing the uncertainty and transaction costs.

④ Improve corporate brand value

Self-operated logistics system will be able to control sales activities independently; all links are responsible for the logistics department of e-commerce enterprises or their own logistics enterprises, which on the one hand can personally serve customers at home, so that customers are close to understanding the enterprise and familiar with the product; on the other hand, enterprises can grasp the latest customer information and market information, and according to customer demand and market development trends to make adjustments to the strategic plan to improve the pertinence of the strategy and customer satisfaction. At the same time, an in-depth understanding of customer needs is also conducive to e-commerce enterprises to develop value-added business.

(2) Disadvantages

① Increased investment burden

In order to realize the direct organization and management of logistics, enterprises adopting the self-management model must spend a lot of money to allocate warehouses, transportation equipment, and logistics personnel, and the investment burden of enterprises increases significantly so that the enterprises' investment in other areas will be reduced accordingly, which undermines the enterprises' ability to resist market risks and reduces the competitiveness of enterprises.

② Management is difficult to control

Although logistics has a very important impact on business, for most e-commerce companies, the logistics department is just the logistics department and logistics activities are not the core business of the company. In this case, if the company chooses to adopt its own logistics model, which it is not good at, then the management of the company will have to spend a lot of time, energy, and resources to deal with these auxiliary work, cross-industry operation is not highly specialized, the result can be said to be half the effort, and its own key business does not play the core role. Therefore, self-managed logistics can lead to more difficult departmental management, and the core competitiveness of the enterprise may also be affected.

③ Limited application scale

For e-commerce enterprises that are not large enough to buy and sell a very limited number of products, it is difficult to achieve economies of scale using the self-operated logistics model. On the one hand, this leads to high logistics costs, which reduces the competitiveness of products in the market; on the other hand, due to the limited use, the specialization of logistics distribution is very low, which makes it difficult to meet the logistics and distribution needs of e-commerce enterprises.

④ Benefit assessment is difficult to conduct accurately

In self-operated logistics enterprises, all the commodity circulation process is completed by specialized logistics departments or logistics companies, forming an integrated system, then each internal function will not separate logistics for independent accounting, so the enterprise cannot calculate the accurate product logistics costs; it is impossible to objectively assess the benefits.

6.3.2.2 Third-Party Logistics

Third-party logistics is relative to the "first-party" consignor and "second-party" consignee; it is a logistics form by the third-party logistics enterprises to undertake enterprise logistics activities, independent of the supply and demand sides.

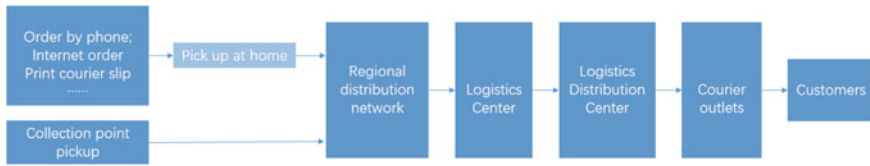


Fig. 6.13 Third-party logistics model

(1) Third-party logistics distribution process

Take a well-known domestic e-commerce platform website as an example; after the buyer places an order on the platform, the seller packs the goods according to the requirements of the order, signs a logistics contract with the third-party logistics company through telephone, network order, courier bill printing, etc. and delivers the goods to the courier who delivers the received courier parcels to the regional network and waits for the delivery vehicle to deliver them to the regional collection network as described by the courier company. When the goods arrive at the regional outlet, they are reclassified and shipped to the regional logistics center at their destination. The goods are scanned and redistributed to the distribution warehouse, where they are organized to reach the appropriate distribution point. Depending on the services contracted for, air or road transportation is selected. The goods will be re-sorted according to the address of the recipient and shipped in full truckloads to the buyer’s logistics distribution center where they are reordered and delivered to the courier point for inspection and sign-off by the buyer (Fig. 6.13).

(2) Advantages of third-party logistics

① Business Advantages

In terms of business quality, the third-party logistics model undoubtedly has a great advantage. Due to the different characteristics of the goods and other factors, the resulting logistics service requirements are very different, for example, fresh products with short storage cycles and some special drugs need fast transportation and refrigerated storage, and dangerous chemicals need to be well secured when dispatched on the road. Companies owning their own logistics systems often cannot meet these differentiated requirements, but the third-party logistics market has to be segmented according to these requirements. Therefore, companies can outsource these tasks to third-party logistics companies, which provide targeted logistics services, thus greatly improving the quality of trade.

In addition, third-party logistics can reduce the impact of backward logistics equipment and IT network delays on the enterprise. The non-specialized logistics department of e-commerce enterprises in the self-operated mode often cannot coordinate with external resources, and when the core business of the enterprise develops at a high speed, the self-operated logistics system cannot keep pace with the forward development of the business due to the backwardness of the equipment and the limitation of the information network, but the third-party logistics can perfectly help the

enterprise break through the bottleneck caused by the backwardness of the hardware facilities.

In this way, the capital invested by e-commerce companies in warehouses, fleets, and infrastructure can be released, accelerating the capital turnover of the companies. In this way, the third-party logistics model can achieve an effective allocation of resources and a higher degree of scale.

② Cost advantage

Firstly, the third-party logistics model can reduce the operating costs of e-commerce enterprises. Professional third-party logistics providers use the professional advantages of scale production and cost advantages to improve the utilization of resources in the circulation process by integrating various logistics resources, so that enterprises can benefit from the separation cost structure. In addition, as enterprises use external logistics roles, they can obtain the cost or fee affirmed by logistics service providers in advance, and the variable cost is converted into constant cost, and this stable cost structure makes the planning and budgeting procedures easier.

Secondly, third-party logistics can reduce the amount of investment in fixed assets of enterprises. By outsourcing logistics, enterprises can reduce the investment in logistics infrastructure and information systems, changing fixed costs into variable costs, and transferring the financial risks caused by the uncertainty and complexity of logistics needs to third parties, especially those companies whose business volume shows seasonal changes; the impact of outsourcing on the company's asset investment is more obvious. After saving the cost and human resources of operators and enterprises, e-commerce companies will have more money and energy to invest in their own products, reducing costs while improving competitiveness.

③ Advantage of customer service

E-commerce companies can take advantage of the information network of third-party logistics companies to improve customer satisfaction in a way that other logistics companies cannot. This information network helps companies improve their ability to process orders, reduce response time to customer needs, provide direct-to-home point-to-point delivery services, and increase customer satisfaction by reducing the delivery time of goods.

Third-party logistics providing targeted customized logistics services can improve the customer's service experience, create higher service value for customers, and significantly enhance the market appeal of enterprises. In addition, the third-party logistics enterprises also have the quality of information network resources, and the ability to monitor the entire logistics process, through advanced information technology and communications technology to monitor the goods in transit in real time, to ensure the timely detection and handling of delivery accidents, and to ensure that the goods can be safe and timely delivery to the destination.

(3) Disadvantages of third-party logistics

① Lower control ability

In this model, the enterprise's express business all outsources to a third-party logistics company. If an e-commerce platform wants to master the whole process of logistics information, it can only get this information through the logistics information management system; in this case, it reduces the platform's control over logistics operations, making the platform subject to the limitations of third-party logistics companies, resulting in slow feedback response, delivery service quality, and low level of operational efficiency problems, and due to the existence of external service providers, enterprises are more likely to appear within the situation of mutual blame, affecting efficiency. For example, in the case of problems in coordination between the two sides, there may be a risk of loss of control of logistics, thus reducing the level of customer service of the enterprise.

② Risk in customer relationship management

As e-commerce enterprises entrust their logistics and after-sales service to third parties, the direct contact with customers becomes less, and the relationship between enterprises and customers is weakened, which is not conducive to the establishment of stable and close customer relationships. In addition, customer information is a very important resource for enterprises, but third-party logistics companies do not deal with only one customer. When third-party logistics companies provide services for the enterprise's competitors, it will increase the possibility of leakage of corporate trade secrets.

③ Increased operational risk

Third-party logistics and e-commerce enterprises have a long-term cooperative relationship; if the logistics enterprise itself is not operating well, it may affect the operation of e-commerce enterprises. But because the stable partnership is often built on a longer teething period, the dissolution of the partnership will incur higher costs.

(4) Third-party logistics and the "last mile"

The "last mile" in logistics distribution refers to the distance from the logistics sorting center to the hands of the customer, that is, the process of delivering the goods to the customer by means of transportation. This "last mile" of distribution is not only the end of the entire logistics chain but also the only link with direct face-to-face contact with customers, a link that is highly valued by e-commerce consumers and a key link to the success or failure of enterprises. Only by doing a good job of "last mile" distribution work, the entire logistics process can be an unimpeded distribution process. Then e-commerce enterprises can really develop.

With the rapid development of society and steady economic growth, automated distribution represented by "unmanned" third-party logistics can effectively promote the development of "last-mile" distribution as an emerging industrial model for the development of the logistics industry. Since January 2020, with the expansion of the epidemic, unmanned logistics has been widely and rapidly applied to the logistics

activities of emergency supplies. Currently, China's unmanned logistics distribution is being used efficiently during the epidemic. A well-known domestic logistics company set up an unmanned distribution emergency team in early February 2020 to test the distribution area from the Ninth Hospital in Wuhan City to the surrounding communities, and completed the deployment of unmanned distribution remotely in just 4 days and successfully completed automated distribution logistics activities in one go. It was possible to deliver 50% of the order quantity using the unmanned robot and to include the neighbourhoods along the route planning in the delivery area. Based on the entire route planning and transportation operation, the "unmanned" third-party logistics delivery can greatly reduce the number of staff on-site supervision and be directly controlled remotely by the system, so that the courier can work through the instructions issued by the system, improving the efficiency of the delivery.

6.3.2.3 Logistics Alliance

Common Delivery, also known as logistics alliance distribution, is a mode in which multiple enterprises join together to provide distribution services by a third-party logistics service company in order to achieve their respective strategic logistics objectives, generally under the unified planning and unified scheduling of the distribution center. These enterprises make a horizontal alliance to form a loose organization with complementary advantages, risk sharing, and benefit sharing. In essence, it reduces operational costs through the scale of operational activities and therefore improves the efficiency of logistics resources utilization.

(A) Logistics Alliance Distribution Process (Fig. 6.14)

(B) Distribution characteristics of logistics alliance

Due to the structural peculiarities of the logistics alliance, this distribution model has the following advantages.

① Mutual partners to reduce logistics costs and risks

The communication links between the enterprises within the alliance are very close, and they can share their resources with each other, which makes the costs arising from searching for transaction objects and transaction information greatly reduced. In addition, through the alliance of logistics services, a good trust relationship is established between these enterprises, various performance risks can be reduced, and conflicts arising from the services can be resolved through peaceful negotiation.

② Contracts for long-term cooperation to maintain the stability of transactions and profits within the alliance

For the sake of maximizing their own interests, all the enterprises within the alliance consider effective long-term cooperation as the optimal strategy. This long-term cooperation can maintain the stability of the logistics alliance, and thus each enterprise can develop stably in the internal environment formed by the coordination of

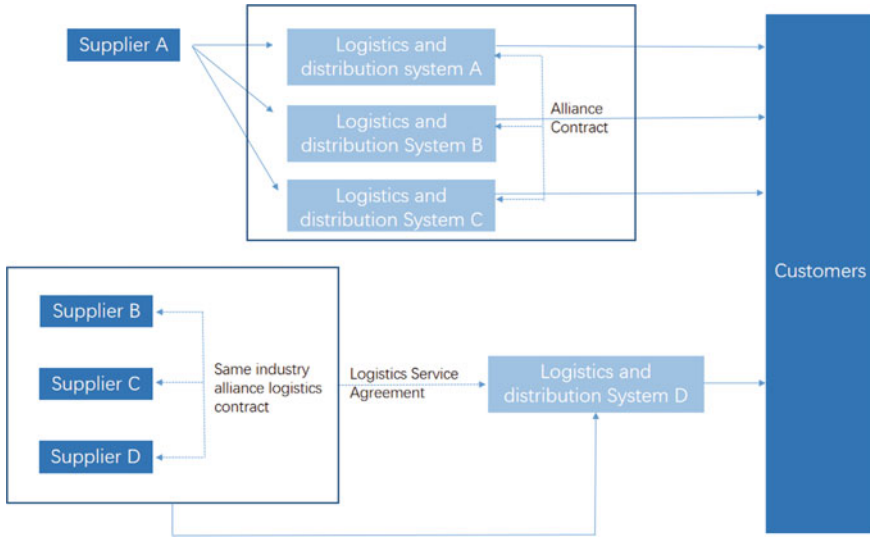


Fig. 6.14 Logistics alliance distribution process

the established alliance mechanism. In this way, the frequency of uncertainty and inefficient transactions in the transaction process will be significantly reduced, which in turn will reduce transaction costs in this respect. Such stable, long-term cooperation will motivate these companies to make their common profits bigger and obtain stable profit margins.

- ③ Learn from each other, build on the strengths, and avoid the weaknesses, and the model development potential is high

From the development history of logistics, logistics alliance is a modern form of logistics cooperation established between enterprises and professional logistics service providers. In the logistics alliance, the continuous development of logistics organizations will deepen the connection between the supply chain of enterprises, and mutual collaboration will also enrich the logistics needs of users. With the gradual development of continuous and honest cooperation, these e-commerce enterprises can learn from each other, such as each other's technical advantages and rich experience, so as to build on their strengths and avoid their weaknesses and gain sustainable development.

However, the logistics alliance model is faced with many uncertainties because it involves multiple cross-border e-commerce enterprises, thus making it difficult to ensure operational efficiency. When a logistics alliance fails to obtain the expected benefits for its members due to poor operation or when the benefits of the alliance are distributed unreasonably, it may lead to members adopting a negative cooperative attitude, thus failing to give full play to the complementary value of members' advantages. In addition, in actual operation, it is often due to a variety of reasons that the logistics alliance cannot effectively integrate the human, financial, and material

resources of each member, thus making the logistics alliance model unable to play its proper value.

(C) Application of logistics alliance

The distribution of fresh agricultural products has always been a major difficulty in the logistics business of enterprises. Fresh agricultural products are characterized by large order quantities and scattered distribution destinations. Due to the low unit value and high requirements for the freshness of the products, although individual distribution can guarantee freshness, it will certainly increase logistics costs and compress profit margins. If combining the qualities of fresh agricultural products that are different from other commodities in the distribution process, we can build a logistics alliance to break the blockage of fresh agricultural products end distribution, guarantee the quality of fresh agricultural products, and improve the logistics efficiency of alliance members.

(1) The regional characteristics of the alliance are obvious

Fresh agricultural products have obvious regional characteristics of origin, so when distributing fresh agricultural products, it is not suitable to blindly pursue the expansion of the distribution range. If only the expansion of the distribution range is pursued, it will not only reduce the taste of goods due to the long distance but also increase the storage cost and transportation cost. Therefore, when building the logistics alliance in fresh agricultural product distribution, it is necessary to control the alliance within a certain area, reasonably allocate resources, realize efficient distribution, and reduce the loss of quality of agricultural products.

(2) Diverse value-added affiliate services

As the value of fresh agricultural products is generally low, if the logistics alliance simply delivers agricultural products for consumers, the logistics alliance cannot meet the diversified needs of consumers. If the alliance can combine the advantages of different distribution enterprises within the alliance to provide comprehensive and enhanced services in the distribution process, such as grading and selecting agricultural products, and even matching different packaging with different products, it can meet the needs of different consumers and improve market competitiveness.

(3) Agile alliance response mechanism

Compared with traditional distribution methods, the form of alliance is more convenient to realize the form of distribution service with rich variety, small batch size, and high distribution frequency. Generally speaking, retailers tend not to stock a large amount of agricultural products in order to maintain their freshness, which poses a challenge to the construction of logistics alliance in fresh agricultural product distribution, which requires the alliance to find a balance point between the economy of scale and small batch distribution to meet customers' needs. The logistics alliance can manage the distribution tasks in a unified manner according to the demand situation in the region, and reasonably allocate the distribution volume and distribution path. In this way, the alliance can provide more efficient distribution services and

even achieve multiple deliveries a day to retailers, better guaranteeing the freshness of agricultural products.

(4) Alliance intermediate links are shortened

The quality, taste, and edible value of agricultural products will affect their freshness. If there are too many intermediate links and too long a delivery time for agricultural products such as fruits and vegetables with high moisture content, it will lead to water evaporation and reduce freshness, which will directly affect consumers' purchasing experience and sales of agricultural products. Therefore, building a logistics alliance in fresh agricultural product distribution will significantly reduce the number of intermediate links from the wholesale market to the retailer and retain the freshness of perishable goods.

(5) Increased efficiency of alliance distribution

Once the alliance is formed, the information of retailer members within the alliance will be unified and integrated together. Before the alliance was formed, the traditional fragmented distribution method had no way to consider distribution locations from a holistic perspective, which often led to low marginal effects of suppliers in distribution. However, after the alliance is formed, since the daily demand for fresh produce in a regional area tends to be stable and will not fluctuate significantly up and down except for special circumstances, the alliance can refer to the information provided by the previous retailers and consider the information on distribution distance, distribution quantity, and distribution type to provide a stable distribution path for suppliers. In case of special circumstances, the alliance can also rearrange the distribution path according to the specific situation. The formation of a logistics alliance in the distribution chain will greatly improve distribution efficiency and enable retailers to also obtain a relatively stable state in terms of both the quality of agricultural products and distribution services.

(6) Alliance distribution risk reduction

The traditional distribution process of fresh produce is subject to various constraints such as traffic congestion, and distant or too remote distribution destinations, which often fails to deliver the produce on time and also depletes the quality of the produce. In such logistics alliances, the members are in a risk-sharing partnership to fight against the uncertain risks brought by market fluctuations as a whole. Suppliers coordinate with each other to avoid the risk of out-of-stock to a certain extent.

6.3.3 End-of-Line Express Delivery

Terminal express delivery is the last section of the commodity distribution process, which refers to the logistics activity of delivering the parcels from the last delivery network of the express service provider to the designated address. China's vast territory, geographic environment, terminal distribution network, and the degree of

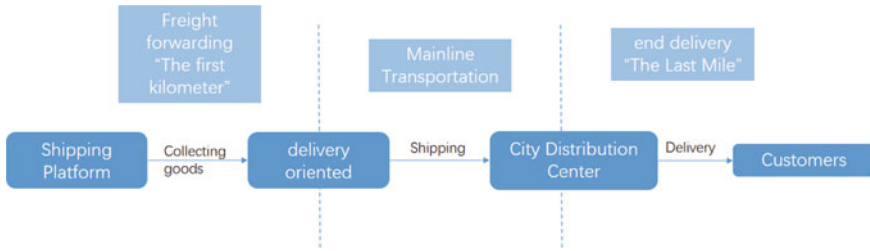


Fig. 6.15 End-of-line express delivery process

construction of facilities vary greatly, and the “last mile” of express delivery is crucial to the development of the entire e-commerce industry (Fig. 6.15).

The current terminal express delivery mode is mainly divided into two categories: home delivery mode and express pickup mode.

6.3.3.1 Home Delivery Mode

The door-to-door delivery mode is the most common end delivery mode in which e-commerce enterprises deliver goods to designated customers at the agreed time in accordance with the “5R” principle. The delivery personnel deliver the goods to the customer’s required location from the city distribution center and contact the customer when the goods are about to arrive. Delivery personnel from the city distribution center, according to the location requested by the customer, when the goods are about to arrive to contact customers and delivery. “Door-to-door delivery” is a service that directly faces customers, and delivery personnel complete the handover of express delivery with customers in person, and can also provide services such as on-the-spot inspection, cash on delivery, and timely return, which enhance customers’ receiving experience to a certain extent. At the same time, delivery personnel can directly obtain customer feedback, which is conducive to the development and improvement of enterprise business. However, in practice, the vast majority of customers do not specify the time. There is a difference in time matching between the fetching and sending parties; usually, the courier needs to wait. If the delivery time is too long, other orders will be affected. Sometimes, the Courier needs to deliver the goods for a second time, which increases the delivery cost and reduces the delivery efficiency. (Fig. 6.16).

Distribution on the “last mile”, from the perspective of logistics costs, is at the core of the entire logistics process. Improving and solving the “last mile” problem can effectively reduce the logistics costs of express delivery, reduce the total expenditure of logistics costs, and increase the economic profit of the courier industry, which keeps an absolutely advantageous position in the low-end competition. The “march to the countryside” is an important development strategy for all e-commerce enterprises, the home delivery mode has also been from the city to rural towns, but due to traffic, geographic location, and other reasons, the “last mile” distribution costs are high and efficiency is low. This has also become a gulf in the process of the courier to the countryside, the sinking of e-commerce.

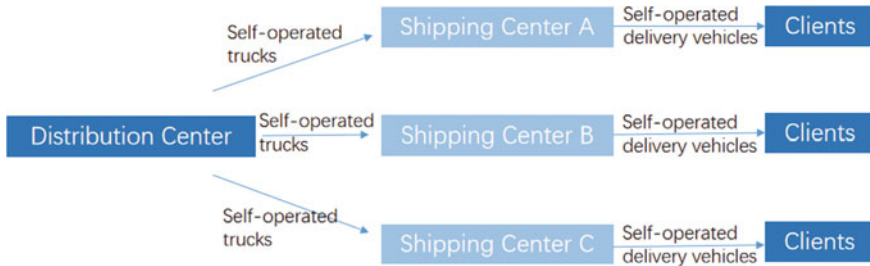


Fig. 6.16 Home delivery service mode

6.3.3.2 Express Self-pickup Mode

Express self-pickup mode is when e-commerce enterprises in accordance with the promised time frame deliver the express to the designated pickup point, and notify customers in the agreed time to pick up their own. Express self-pickup mode reduces the waiting time of the single delivery of the distributor, and the distributor can deliver more orders at the same time, but there are also disadvantages of the express self-pickup mode. This mode increases the construction costs of the express terminal self-pickup point, and the simplification of the delivery link leads to more difficulty to recover compensation for damage to the goods.

“Self-pickup” mode is the delivery personnel centralized delivery to the express site, the customer to the express site to pick up. This model effectively solves the problem of low efficiency and high cost of “home delivery” delivery. At present, the main forms of self-pickup outlets are self-pickup stores, intelligent self-pickup cabinets, and cooperation with convenience stores.

(1) Self-pickup stores

The delivery personnel will send the express mail to the self-pickup stores and notify the customers to pick up the parcels through SMS, and the customers will pick up the parcels at the stores according to the information. This model assists express delivery enterprises to complete the “last mile” delivery work by establishing terminal delivery stores, realizing the efficient integration of terminal resources such as delivery personnel and outlets, and solving the problem of “difficult delivery” for express delivery enterprises.

(2) Intelligent self-service cabinets

This model is set up by electronic control and monitoring of the automated storage smart cabinet to complete the self-pickup of express delivery. Courier companies will store the parcels in the self-pickup cabinet, notify customers of the pickup through SMS, and inform the pickup code; customers pick up the parcels according to the pickup code, making the pickup more flexible. And the store is usually manned, and customers can get a timely solution to problems encountered in the pickup process, which is conducive to improving customer satisfaction. However, self-pickup stores



Fig. 6.17 Courier pickup service model

are generally established in places with convenient transportation and high traffic flow, and these places often have higher rents, resulting in higher store construction costs. On the other hand, the pickup distance also affects the customer experience to a certain extent.

From the customer's point of view, compared to the manned self-service stores, self-service cabinets through the pickup code to pick up the pieces are conducive to the protection of privacy. From the operator's point of view, self-service cabinets replace manual services with technology. In the long run, if the use of self-service cabinets can reach a certain scale, the model will greatly reduce the labor cost of terminal distribution. However, due to the type and size of parcels in the cabinet being limited, customer pickup is not timely and has higher maintenance costs; the self-service cabinet model still has certain limitations: the short term cannot completely replace the manual distribution.

(3) Convenience stores

These stores generally refer to super convenience stores, mailrooms, etc. In its essence, this model treats convenience stores as terminal distribution outlets. Courier companies will deliver the parcels to the convenience stores, and the customers will go to the nearest stores to receive the express mail at a convenient time.

Compared with the self-built self-pickup stores, the model saves the construction costs of the network, but there are certain shortcomings. First of all, convenience stores have their main business; compared to the professional operation of the courier collection outlets, the collection and management of couriers will not be in place; secondly, because customers cannot pick up the goods in time, convenience stores charge customers overtime charges, inevitably affecting customer satisfaction; finally, cooperation with convenience stores needs to pay a certain amount of delivery costs to them, which in turn increases the input of courier companies (Fig. 6.17).

6.4 Summary of this Chapter

E-commerce circulation is a manifestation of commerce circulation in the field of e-commerce. According to the order of commodity circulation, the circulation of e-commerce can be divided into three links: product procurement, product storage, and product logistics and distribution.

Product procurement is the first link of e-commerce circulation, based on this, there is a follow-up on the goods into the warehouse, sales, logistics and distribution, and other circulation processes. In the e-commerce industry, the common procurement model is mainly self-selling model, one piece of hair model, and multiple owners warehouse model, three types. Procurement link is to generate purchase orders, followed by the normal product warehousing and returns. As an intermediate link in the flow of e-commerce, the procurement of products from the warehouse and the next circulation process of warehousing are in the middle of the flow of goods. According to the ownership of the warehouse, product warehousing can be divided into self-built warehousing, third-party warehousing, and self-built + third-party warehousing, three models.

Product logistics and distribution is the final link and an important part of the e-commerce distribution system, and an important carrier for expanding domestic demand and promoting consumption. With the development of digital technology and the advent of the new retail era, a variety of logistics and distribution models have emerged. According to the different locations of warehouses from customers and the main body that carries out logistics and distribution, the product logistics mode can be subdivided into various logistics modes such as cold chain mode and self-operated logistics mode. Terminal express delivery is the last section in the process of commodity circulation in the real sense. These logistics and distribution modes are changing with the development of the times and the needs of consumers, and the innovation of logistics and distribution is very crucial to solve the problem of the “last mile”.

6.5 Review Reflection Questions

1. Briefly describe the specific process of product procurement.
2. Analyze the application scenarios for which the three procurement models are suitable.
3. Briefly describe the significance of the storage aspect of product distribution for the development of e-commerce.
4. What kind of applications are there in the cold chain logistics model at home and abroad? What is the development status?
5. Briefly describe the operation process of the front warehouse + central warehouse model.
6. How does the application of the origin model guarantee the “first mile” of agricultural products out of villages in China?
7. How will the innovation of the third-party logistics model solve the problem of the “last mile”?
8. What kind of impact has the new crown epidemic had on the development of logistics and distribution?
9. Summarize the similarities and differences between the three logistics models according to the distribution body.

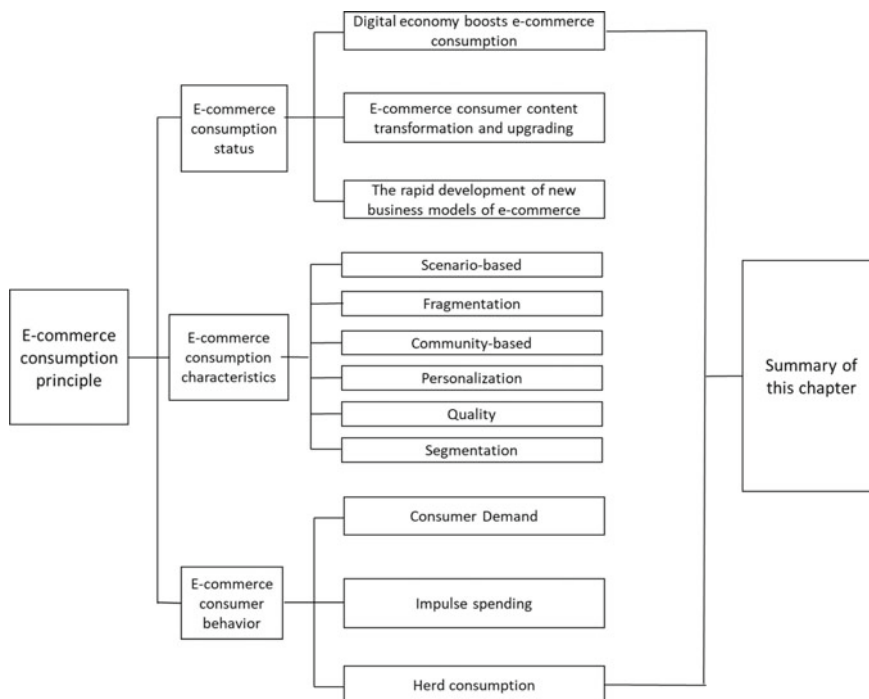
10. Briefly explain how end distribution should be reasonably applied in grassroots areas in China.
11. How will the innovation of the three links of e-commerce circulation affect the development of China's trade circulation industry?
12. How does the development of e-commerce circulation contribute to the solution of the problem of inadequate and unbalanced development in China?

Chapter 7

E-Commerce Consumption Principles



Knowledge Map of this Chapter



UGC (User Generated Content) Platform—Xiaohongshu

Xiaohongshu community content covers various lifestyle areas such as food, travel, trends, beauty, care, entertainment, fitness, reading, mother child, etc., generating over 3 billion note exposures every day. Users on Xiaohongshu can express their experiences by posting notes and comments in the community, while other users will do their homework before purchasing products by searching for keywords. The two-way interaction between users and users invariably promotes the sales of products that really work well, and the shopping experience of other buyers who are also consumers is more convincing than the boring propaganda of merchants.

The positioning of Xiaohongshu is a lifestyle-sharing platform. In the Xiaohongshu community, users can share their consumption experience and sense of use to others, and the desire to buy quality products will be generated through the communication among users. After the desire to buy is generated, users can buy through the purchase interface, and the purchaser interface is different and the price is different. Among them is the Little Red Book's own Little Red Book Welfare Club, which not only has the strong endorsement of Little Red Book but also has the guarantee of genuine products. After looking at the introduction, the one-stop service of sliding on another interface to select the goods is very easy to operate.

In the case of Xiaohongshu, a UGC socialized marketing platform, we can see that there are three levels of development of such platforms, namely: intelligent personalization, product boutique, and recommendation specialization.

(1) Intelligent personalization

The most important point for UGC social marketing platform to attract users is to correctly identify the preferences of target users and push the direction of interest according to their search records. Big data push has deviations, and users can choose not interested in improving the accuracy.

(2) The boutique of products

The sales segment of UGC platform products is the main source of profit, and all products should ensure quality. No matter how good the quality of the product is, the marketing methods and the popularity of the platform are useless feats. The platform must also check the brand of occupancy. It is better to introduce well-known enterprises during the first period. With its own development, it can tract some small enterprises, but must pay attention to check.

(3) Recommendation specialization

UGC platform generally has a few experts with very strong professionalism and can make a lot of opinions from a professional point of view. In the users' view,

with the pace of the big V, the sense of dependence and trust in the platform has increased dramatically. The resource integration ability of the platform is far stronger than that of ordinary users, and the specialization of the platform is a much stronger soft power than the popularization power, which is surely the direction of future UGC platform efforts.

Consider:

1. What do you think determines the development direction of UGC platforms such as Xiaohongshu?
2. Talk about how UGC platforms should play a good role in the future to accurately connect consumer needs and achieve the integration of user resources?

7.1 Current Situation of E-Commerce Consumption

7.1.1 Digital Economy Boosts E-Commerce Consumption

The year 1999 is the first year of the development of E-commerce in China. The launch of Alibaba Group marks the beginning of China's digital economy. On March 5, 2015, the Third Session of the 12th National People's Congress adopted the "Internet Plus" Action Plan, which elevated the "Internet Plus" strategy to the national strategic level. In recent years, with the application and popularization of new-generation information technologies such as big data, mobile Internet, AI, cloud computing, and 5G, the era of the digital economy is accelerating. The integration and evolution of new technologies, new applications, and the Internet has led to the rapid development of Internet applications. In particular, digital economies such as e-commerce, online education, and telemedicine have shown strong resilience in the face of COVID-19. With its rapid development, wide range of radiation, and strong influence, the digital economy is becoming a key force reshaping the global economic situation and development pattern.

According to the 49th Statistical report on China's Internet Development, consumption has shown a new state of development, and domestic consumption has been upgraded and expanded (Table 7.1).

The outline of the 14th Five-Year Plan proposes to "promote the building of a cyber power, accelerate the building of a digital economy, a digital society and a digital government, and drive the transformation of the mode of production, way of life and way of governance through digital transformation". At the same time as enterprise digital transformation, intelligent and manufacturing integration development, rural digital transformation is also expanding, a large number of new forms of business and new business development model booming, modern agricultural informatization level and production capacity unprecedented improvement; at the same time, in terms

Table 7.1 Specific performance of domestic consumption upgrading and expansion

Classification	Specific performance of upgrading and expanding domestic consumption
Consumer groups	Online shopping is the most popular among those born in the 1980s and 1990s, and the consumption potential of those born in 1995 is the greatest. Those born between 1980 and 1995 have the highest online shopping rate, accounting for 93%. Those born after 1995 have the greatest potential for online consumption, with 41.9% of them spending more than 30% of their daily consumption online, a higher proportion than other online shopping groups
Consumer trends	Domestic brands are more aware of online shopping. Driven by cultural confidence and brand upgrading, online shopping of domestic brands is booming, and domestic brands are widely favored by online shopping users. Data shows that users who support domestic products and shop online for domestic brands account for 65.4% of the total online shopping users. Online shopping of Domestic products Users mainly buy mobile phone digital products, household appliances, beauty makeup and skincare, sports apparel, and so on

of digital industrialization, with key core technologies such as 5G and recognition of services brought by big data applications by enterprises and consumers, data has become a key element to promote economic development. Digital economic industries such as IoT, AI, and e-commerce are making increasing contributions to urban and rural development.

7.1.2 Transformation and Upgrading of E-Commerce Consumption Content

With the digital transformation of economy and society, industrial products with mechanical and physical functions can no longer fully meet the needs of market consumption. Both 2B and 2C terminals need digital, intelligent, and personalized products and services provided by enterprises. In the era of e-commerce, the supplement of data elements is beneficial to enterprises' products and services to change their consumption patterns. As time goes by, the new network consumption mode brings the source of market renewal. In this context, enterprises will also usher in new development opportunities. The transformation and upgrading of online consumption are reflected in the following points (Fig. 7.1).

From functional consumption to data consumption: at present, consumers complete consumption in the context of data characteristics, which requires that products and services in the market not only have some mechanical functions but also must have service functions based on data. Data expands the capabilities of products and services, and businesses and people alike want to pay for the convenience of data services, resulting in a lot of data-driven consumption.

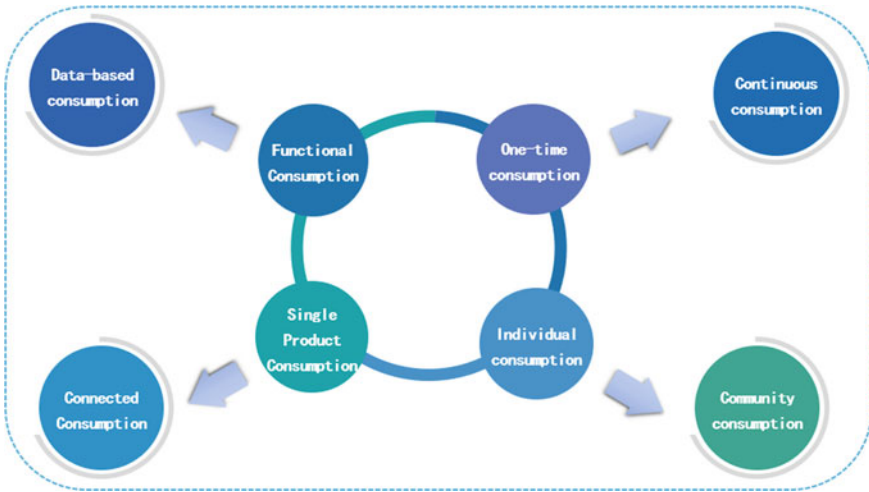


Fig. 7.1 Transformation and upgrading of online consumption content

From one-time consumption to continuous consumption: digital product innovation greatly improves the frequency and viscosity of interaction between products and customers, thus forming a continuous service model based on the combination of customers and data. In the case of Internet TV, customers will not only buy the TV once but will also pay an ongoing fee for various content connected to the Internet. This continuous consumption pattern is the digital transformation direction that traditional enterprises must focus on. In general, continuous consumption has led to new business models based on enterprise products.

From single product consumption to network consumption: in the industrial age, the sales of industrial products with certain functions are often just single product consumption. The emergence of the Internet of Things means that industrial products are capable of digital transformation. Enterprises have the characteristics of product network, customer network, and other cyberspace when they operate and serve. The emergence of new network consumption forms has greatly expanded the market space.

From individual consumption to community consumption: The consumption model of the industrial age is a single individual unit, whose production and sales often revolve around how to activate the individual consumption market. In the era of data elements, there are more extensive data connections between people. This close connection is not a single individual faced by businesses, but a network community.

With regard to China’s prominent structural problems, efforts must be made to harmonize the stages of production, distribution, distribution, and consumption to promote the organic unity of efficiency and equity. Among them, efficiency corresponds to a more productive link, further emphasizing “high-quality development”. There are more equitable distribution links, and equitable distribution smoothens the cycle of production and consumption.

7.1.3 Rapid Development of New Forms and Modes of E-Commerce

In recent years the rapid development of e-commerce in China has become “an important part of the digital economy and real economy”, is “creating digital industrialization and boost industry digitization, an important engine of digital governance, is an important way to improve the quality of people’s living, is the important force to promote the development of national economy and social”. According to the latest data from the National Bureau of Statistics, China’s online retail sales reached 13.0884 trillion yuan in 2021, up 14.1% from the previous year. Among them, online retail sales of physical goods reached 10,804.2 trillion yuan, up 12.0%, accounting for 24.5% of the total retail sales of consumer goods. At the same time, with the gradual decrease of the growth dividend of the number of Internet users and the continuous improvement of the penetration rate of e-commerce consumption, the development speed of e-commerce is also slowing down year by year. In the future, in the process of industrial Internet development, the precise connection between e-commerce and consumer demand will bring new directions and growth space for the future development of e-commerce. How to promote the digital transformation of traditional consumption, serve the supply side, product innovation, and brand building, which is not only the inevitable trend of the development of e-commerce itself but also the first driving force of the digital transformation of traditional industries.

Under the impetus of new technological revolution and industrial transformation, the development of e-commerce has been endowed with richer connotation. E-commerce enterprises attach importance to the consumer as the center, grasp, understand, and predict the needs of users, and then systematically create products and scenarios to meet the real and potential needs of different consumer layers.

The three directions of future development of e-commerce are format innovation, scene innovation, and mode innovation. During the period of the outbreak, live e-commerce, content e-commerce, and community groups to purchase have increased dramatically, offline new retail also presents a huge development potential, the new model shows the development of China’s e-commerce industry huge vitality and broad space for development has become an important domain of China leading the world electronic commerce application. In the direction of innovation, the deep integration of offline physical space and physical service resources has become the main trend. For example, door broadcast, factory broadcast, and village broadcast in live broadcast are increasingly becoming the mainstream, community group buying is widely combined with offline convenience stores, and the proportion of e-commerce applications of traditional service enterprises is also continuously increasing. By increasing the new mode of e-commerce, a large number of traditional service enterprises are strongly attracted to realize smooth digital transformation.

The emergence of the primordial universe in 2021 shows an accelerated convergence of the virtual and the real. In 2019, virtual idols were born, and the 1.0 era of “New Idol Era” virtual idols was ushered in by Rakuteni and Hatsune Miku. In

2021, the consumption power of the post-1995 generation will grow, and the post-2000 generation will become the new consumers, ushering in the virtual idol 2.0 era with new models such as new technologies, new concepts, and new experiences.

Apart from virtual idols, the original universe is also one of the keywords of 2022. The primordial universe is one of the innovative new concepts based on the Internet. It is a symbiotic world of the virtual and the real, which communicates with the real world and exists in parallel. The meta-universe is just one of the processes of the digital world, which is formed by the collision and fusion of numerous virtual worlds and digital contents. The digital universe is a virtual world independent from the real world, with N virtual forms, such as N primordial universe, N virtual digital people, N NFC, etc. The birth of the “original universe” has brought new forward momentum to this era, pulling the rapid operation of digitization, and the industry and investment community “have to move forward”. At the same time, the prospect of diversified development also brings marketing possibilities that can not be ignored. The new virtual world with new concepts is on the rise, and it is also the “value” target that each industry is brave to fight for.

In the future, young consumers such as the post-90s and post-00s want to share data. E-commerce enterprises will provide more personalized and accurate products and services based on this, and the order quantity of personalized products will increase significantly.

7.2 Characteristics of E-Commerce Consumption

In the past, much of the popularity of a product or service was known after sales figures came out. At present, more and more enterprises use big data, cloud computing, AI, and other information technologies to transfer design, procurement, manufacturing, logistics, sales, and other links to the “cloud”, which can not only correctly grasp the demand data of consumers, but also get users’ feedback in the first time. At the same time, residents’ disposable income continues to rise, and the number of high-grade and demanding consumers increases. As this trend changes, online consumption, intelligent consumption, experience consumption, customized consumption, and other emerging consumption momentum, consumption has changed from “conformity” to “attitude”.

With the consumer society matures, e-commerce consumption is subject to each of the age, gender, and social class in advance, the pleasure principle influence gradually strengthen, consumers begin to pursue individuality, the pursuit of self, diversification of consumption becomes the most basic characteristic of the consumer market, the key performance in consumption personalized, diversified consumption and short cycle from three aspects. At the same time, the consumption in the era of e-commerce is not constrained by time and space, the fragmentation of the market is formed, and the consumption community is prominent. E-commerce consumption has gradually formed six features scene-oriented, fragmented, mobile, community-oriented, fine-differentiated, and quality-oriented, as shown in Fig. 7.2.

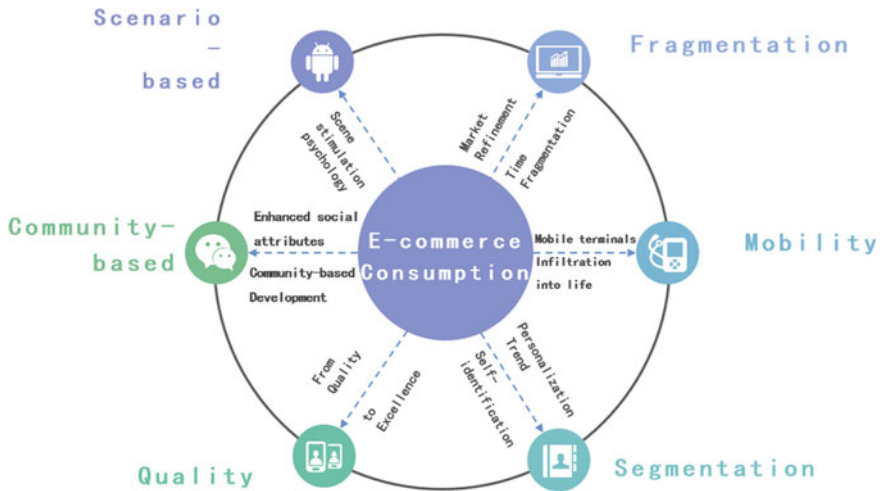


Fig. 7.2 Consumption characteristics in the e-commerce era

7.2.1 Scenario-Based

Under the traditional consumption mode, the consumption time and space are not independent enough. In the age of e-commerce, the consumption process is no longer limited by time or space. Therefore, e-commerce can predict consumer behavior based on the study of consumer psychology, and set up the corresponding scene to make consumers into the psychological state of consumption, so that consumer behavior is more likely to occur. Among them, the construction of consumption scene can be realized by a picture, an article, a video, or a certain activity or atmosphere in reality. Whether online experience or offline consumer place, shaping senses have become more important, need comprehensive creation experience, such as vision, hearing, touch, and smell from sense drive emotional link, to build the brand of “nourish senses force”, has become the important emotional connection between brand connection consumer, need in every link of brand marketing. Whether it is scene innovation, product design, product material selection, and consumer touch points, it is necessary to establish a brand vision that is completely new, sensory and can attract consumers emotionally.

7.2.2 Fragmentation

With the improvement of people’s living standards, the demand of consumers has exceeded the low-level demand stage, rising to the realm of aesthetic demand and spiritual demand. At present, the further expansion of the market scale of various industries, subdivision, and the development of e-commerce with the change in

market demand. In essence, market demand is the demand of consumers, and the personalized and diversified demand of consumers expands the new conception of e-commerce for enterprises. In the future, stores should make full use of the new advantages of e-commerce era, carry out more accurate market positioning, and meet the diversified needs of consumers.

Life in the network era has formed a fragmented structure. Fragmentation and hypermedia make people pursue “efficiency” and instantaneity, thus bringing a certain impact on consumer psychology and producing consumer’s fragmented demand. Fragmented scenes such as before the start of a movie, while eating in a restaurant, or after going to work and taking a bus are natural opportunities for e-commerce consumption.

In recent years, all fields of society have focused on the phenomenon of “fragmentation” of society. Under the influence of social class differentiation, individual consciousness awakening, value system, and diversified lifestyle, the overall social relations, market structure, and social concepts in the past have been divided into separate interest groups, cultural tribes, and social components. In this context, fragmentation has become a major trend in social development, and under the influence of this trend, great changes have taken place in all fields. In terms of consumption, fragments of information have five forms of expression, each of which is more rational, the inner pursuit of feeling and experience is stronger, self-awareness is aroused, the trust in authority is weakened, and the tendency of the crowd is weakened. Consumers seek a valuable “sense of content acquisition” from extensive exposure to a large amount of information, and the content route has ushered in a new “cocoon breaking” upgrade. From the rise of wechat public account long picture and text to xiaohongshu and micro blog short picture and text planting hot. From long video viewers to short video, until the concept of medium video was proposed. Content in the Internet industry has been updated rapidly, and in 2022, some new directions of content courses have also received attention. For example, the systematization of short entertainment, the refinement of content cost, the normalization of live broadcast, the upgrading of medium video and the refinement of short video.

Fragmentation has become one of the characteristics of the times, mainly including the following three aspects.

1. Productivity significantly increased, production capacity serious excess, a large number of similar products appeared on the market. In order to improve their competitiveness in the market and make their products successful, many companies began product innovation, people’s purchasing power continues to improve, more and more consumers pursue customized products.
2. The development of the next generation of information technology has brought subversive changes to human society. People’s ability to collect and process information has been greatly improved, and the influence of traditional advertising marketing on consumers has become weaker and weaker, and people’s self-judgment ability has been significantly improved.
3. In the context that socialized mass production has become a major development trend, many small and medium-sized enterprises can also customize production

for consumers. Small and medium-sized enterprises can join the industrial chain at a lower cost and lower voice, but they have strong stability and sustainability and can continue to promote their development and growth. In the era of traditional media, people all over the country often follow the same TV program. If a company spends a lot of money to advertise in popular TV shows, it is easy to build a strong brand influence in the minds of consumers. This is the logic behind the success of brands such as melatonin and Gentil. Nowadays, people often use mobile terminals such as mobile phones and tablets to browse social media, video websites, and live broadcasting platforms. Content, audience, and media show obvious segmentation characteristics.

At present, enterprises still use traditional marketing methods to expand product sales, which has become more and more difficult. Facing such a fragmented era, the marketing strategy of enterprises must also be adjusted in a natural and effective way. The age of fragmentation is also an age of centralization. The traditional market structure, marketing logic, consumption concept, and consumption values have been completely overturned. People come together in online communities through their interests, careers, and value needs. The emergence of social media such as Wechat, Weibo, and strangers underlines the trend. From the perspective of marketing, fragmentation has changed consumers' information acquisition methods, demand psychology, and purchasing habits. Traditional marketing methods not only cost more and more but also difficult to effectively promote the marketing content to the target group.

7.2.3 *Communitization*

The age of e-commerce has endowed consumption with the social attribute derived from it, and also stimulated the development of e-commerce consumption in communities. In fact, the community is the process of asset management and deep digging of users in the consumption scenario, that is, to achieve a deep understanding of consumers, maintain a high degree of interaction between consumers, and then promote consumer loyalty.

“Community electrical contractor” as a society, city of wisdom, and intelligence digital village, and the inevitable outcome of the economic development, is the modern retail business development of new forms, new scenes, but also the modern urban and rural community governance of fine, intelligent, specialized important content, is one of the important strength of social capital to participate in community governance, is an important form of innovative community convenience, benefit, and service. In particular, it plays a key role in responding to emergencies, home care services, helping the disabled, and helping the poor and other special needs.

7.2.4 Individuation

With the digital transformation of economy and society, the digital characteristics endowed by information technology have gradually penetrated into all aspects of People's Daily life, and the digital economy has shown a vigorous development trend. Traditional enterprises can effectively make use of 5G Internet, big data, and other new marketing methods in the sales process, so as to meet the personalized needs of consumers. The accelerated integration of the digital economy and real economy makes production gradually precise and refined, and at the same time meets the personalized needs of consumers and mass production of products. Consumers' demand for quality and individuation is increasing day by day, and many e-commerce and physical retailers choose to develop their own brands. The product styles and details of private brand e-commerce enterprises are based on the understanding of users through big data, which integrates the life concept of most consumers. Targeted development makes products more accurate and personalized.

7.2.5 Quality

Consumers' demand for products is not limited to material consumption at present, but consumers' purchasing behavior is more based on psychology. Consumers' pursuit of products includes the use value and extension value of products. On the whole, it is the upgrading of product pursuit after the material life is satisfied. In addition to the influence of the economic environment, the factors that cause the transformation of consumer psychology are closely related to consumers' daily living environment.

Consumers have the consumption of the initiative, in other words, consumer product purchase choice is no longer a passive to accept or reject products, and more are built on their purchase intention, on the basis of different consumers purchase intention of making electricity need to constantly adjust operation mode in order to meet consumer demand for product variety. The change of potential psychological needs of contemporary consumers in product purchasing requires e-commerce enterprises to adapt to the change in time and select products with diverse values according to their needs for product upgrading, so as to serve consumers' psychology as much as possible.

With the gradual maturity of e-commerce, consumers' attitude toward online shopping has gradually changed from curiosity to daily habits, and they have also changed from pursuing lower prices to pursuing higher quality for purchasing goods. It is also due to the change in consumer demand, promoting the continuous development and progress of e-commerce, constantly from "quality" to "selective". In the future, select varieties of products will become a new electricity service quality upgrade development direction, at the same time, the enterprise in the location,

design, and sales in the process of goods but also needs to strengthen the understanding of the current consumption demand, provide consumers with a wider range of goods for consumer spending in the process of wider choice platform and space, and then realize consumer's quality demand.

7.2.6 Differentiation

The age of e-commerce provides consumers with more choices. For young consumers, they begin to value the sense of identity brought by-products. In order to meet the self-identity of many consumers, personalized trend, sense of experience, the degree of product segmentation will continue to be deepen.

In the traditional marketing mode, enterprises are basically limited to a certain consumer group in a certain region when market segmentation and market positioning, and it is almost difficult to provide services for a certain consumer. With the advent of the Internet, consumer demand also appears to be more diversified. Therefore, enterprises must attach importance to various resources of existing e-commerce platforms, and make full use of mining, Internet, big data, and other technical means to make a more scientific and detailed professional and personalized distinction between consumers. At the same time, enterprises can also use big data mining and other methods to locate, divide and unite consumers from different regions organically, form scale effect, and provide new interest growth points for enterprises. China's retail industry is fragmented, and different consumers have different needs for different industries.

7.3 E-Commerce Consumption Behavior

7.3.1 Consumer Demand

Network consumption is a new consumption mode that consumers satisfy their own consumption demands through e-commerce platform with the Internet as the technical means. The process of online consumption and purchase is the whole process from the generation of consumers' needs to the satisfaction of their needs, which mainly includes five stages: confirming their needs, collecting information, evaluating their choices, making purchase decisions, and post-purchase behaviors.

1. Identify the requirements phase $S^{(1)}$

When consumers produce transaction demand in order to improve their lack of state, they will enter the confirmation demand stage $DS^{(1)}$.

2. Information gathering stage $S^{(2)}$

Consumers obtain product information needed to meet their own needs through various means 即 $I^{S^{(2)}} = \{I_T^{S^{(2)}}, I_E^{S^{(2)}}\} = S^{(2)}(D)$.

3. Evaluate the selection phase $S^{(3)}$

Consumers compare and evaluate the product information they have obtained $C^{S^{(3)}} = S^{(3)}(I^{S^{(2)}})$.

4. Purchase decision stage $S^{(4)}$

Form the criteria for decision making $B^{S^{(4)}}, B^{S^{(4)}} = S^{(4)}(C^{S^{(3)}})$.

5. Post-purchase behavior stage $S^{(5)}$

After the realization of consumption, consumers evaluate their purchase decisions based on whether the goods or services they buy meet their expected psychological goals $E^{S^{(5)}}, E^{S^{(5)}} = S^{(5)}(B^{S^{(4)}})$. In addition, consumers cannot only evaluate the purchased goods but also share and spread the evaluation, so as to influence other potential consumers. If this post-purchase sharing mode is denoted as, and the sharing scope is denoted as, then: $E_s^{S^{(5)}} S(E_s^{S^{(5)}}) S(E_s^{S^{(5)}}) = [S_{ij}(E_s^{S^{(5)}})]_\infty =$

$$\begin{bmatrix} S_{11}(E_s^{S^{(5)}}) & S_{12}(E_s^{S^{(5)}}) & \cdots \\ S_{21}(E_s^{S^{(5)}}) & S_{22}(E_s^{S^{(5)}}) & \cdots \\ \vdots & \vdots & \ddots \end{bmatrix}$$

refers to the impact of the first consumer's evaluation

and sharing on the first potential consumer. $S_{ij}(E_s^{S^{(5)}})ij$.

To sum up, the online purchase process can be described as follows:

$$E^{S^{(5)}} = S^{(5)}(S^{(4)}(S^{(3)}(S^{(2)}(D)))) \tag{7.1}$$

Maslow, a famous American psychologist, once proposed the classic theory of the hierarchy of needs, namely Maslow's Hierarchy of Needs. In this hierarchy of needs theory, Maslow divides needs from low level to high level into five levels: physiological needs, safety needs, social needs, respect needs, and self-actualization needs. These five needs are the most basic, innate factors that influence individual behavior.

In the context of e-commerce consumption, when consumers have a desire for a certain commodity or service, the lack of consumers physically or psychologically is the consumer demand in e-commerce.

Based on Maslow's hierarchy of needs theory and the characteristics of e-commerce, the book divides consumer demand in e-commerce consumption into five levels: price demand, quality demand, social demand, personalized customization demand, and self-realization demand. The specific meanings of each level are shown in Fig. 7.3. $H_1^N H_2^N H_3^N H_4^N H_5^N$ (Fig. 7.4).

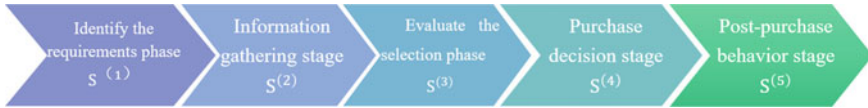


Fig. 7.3 Network consumption process

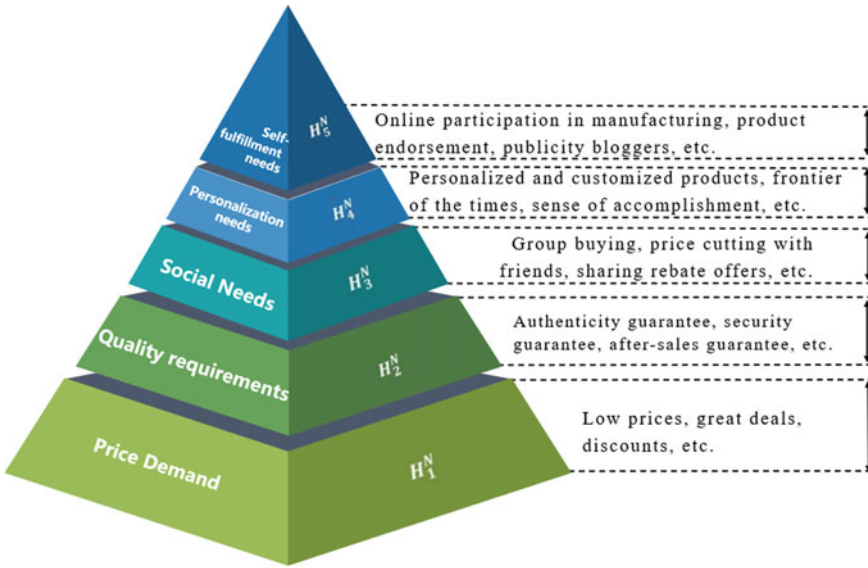


Fig. 7.4 Hierarchy model of e-commerce consumption demand

Similar to Maslow’s hierarchy of needs, the e-commerce consumer hierarchy of needs has the following three characteristics:

1. Only when consumers meet their own low-level basic needs, there will be higher-level needs, that is, when consumers demand, there will be. $D \supset H_k^N D = H_1^N \cup \dots \cup H_k^N \quad 1 \leq k \leq 5$
2. When consumers are unable to meet higher-level demands, they will rely on the pseudo-pleasure brought by lower-level demands, that is, consumers will try their best to meet the highest demand within the range of their ability. At this point, the utility brought by the demand at this level is the maximum. $U^N U_1^N < U_2^N < U_3^N < U_4^N < U_5^N$
3. Consumers are more willing to try their best to meet high-level demands than to fully meet low-level demands. That is, the time consumers spend on the level is, if, then, even if $H_m^N t_m^N H_n^N t_n^N m < n U^N (H_m^N \& t_m^N) < U^N (H_n^N \& t_n^N) t_m^N \gg t_n^N$.

7.3.1.1 Price Requirements

Price demand is the most basic demand of consumers. The price of consumer goods is the most important factor affecting consumer choice when the goods and services purchased by consumers meet the quality recognized by consumers. The lower the price of consumer goods, the greater the discount and discount for purchasing goods, the greater the price demand of consumers can be satisfied.

7.3.1.2 Quality Requirements

The quality demand of consumers is the second largest demand level of e-commerce consumers. On the basis of satisfying the price demand, the guarantee of genuine product, safety guarantee, and after-sale guarantee constitute the second major demand factor of consumers in the process of a consumption choice.

7.3.1.3 Social Needs

With the continuous expansion and prosperity of the e-commerce market, the e-commerce era endows consumers with social needs in the process of purchasing goods through the means of user community management. By means of group-buying, bargaining with friends, and sharing rebates, consumers have positive interactions with friends, relatives, and merchants, further expanding market share and increasing consumption stickiness.

7.3.1.4 Personalized Customization Requirements

The rapid development of modern science and technology and the increasing diversity of human societies and civilizations have created unprecedented space for people to choose. A large number of new lifestyles and consumer groups have emerged. The pursuit of trendy, highlight personality, and highlight self has gradually become the main wish and demand of a new generation of consumers. As described in Maslow's hierarchy of needs, demand is a process of continuous development from low level to high level, and there are certain differences in everyone's needs, which will inevitably lead to different ways of consumption, so consumer demand presents a personalized trend. Personalized customization needs include personalized customized products, the forefront of the times, the sense of achievement, and so on. Therefore, new business innovation, whether product innovation or business service innovation, will be carried out around high-end quality and spiritual needs so that consumers have a sense of presence, ceremony, participation, and happiness.

7.3.1.5 Self-actualization Needs

In the Internet era, consumers' self-realization needs can be realized through online participation in production, product endorsement, and blogger publicity. For example, with the development of society and the improvement of people's overall quality, the concept of sustainable development has been recognized and accepted by more and more people. Buying eco-friendly food and promoting the concept of green nature has also become a way to satisfy self-actualization needs. Maslow's hierarchy of needs theory points out that the intensity of self-actualization needs will not decline with the satisfaction of needs, but the more satisfied the needs are, the stronger the needs will be. It is conceivable that in the future of the e-commerce era, people's demand for self-realization of e-commerce consumption will continue to grow, which is expected to further drive the development and prosperity of the e-commerce industry.

7.3.2 Impulse Spending

Impulse buying refers to the purchase of non-essential items or other items, usually because of promotional advertising or other factors. Emotional experience is an important factor leading to consumers' impulsive purchases. In the context of e-commerce live broadcasts, consumers with high pleasure and high arousal are more likely to have impulsive purchase intentions. External stimuli such as promotion intensity, anchor characteristics, and live broadcast activity are important factors affecting consumers' emotional experiences. Improving the level and intensity of these external stimuli can enhance consumers' perceptual pleasure and perceptual arousal. Emotional experience is an important internal mechanism of external stimulus affecting consumers' impulsive purchase intention.

Generally speaking, impulse purchase includes four types: one is a pure impulse purchase, which is an evasive purchase that breaks the normative purchase mode; second, reminder purchase, which occurs when a consumer is reminded of the need to buy when he or she sees a product; third, suggestion purchase, which occurred when the consumer saw the commodity and imagined the demand for it; the fourth is planned impulse purchase, that is, when consumers have no purchase plan but buy because of promotional activities such as discounts. What these four impulsive purchases have in common is unplanned behavior. Consumers have no clear intention to buy the product before they see it, but decide to buy it on the spot after receiving relevant incentives. The stimulus received in the process of shopping is the catalyst for consumers' impulsive buying (Fig. 7.5).

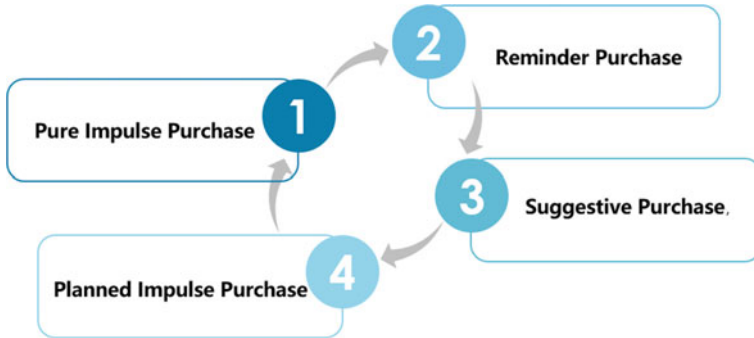


Fig. 7.5 Impulse purchase types

7.3.2.1 Promotion Intensity

When the discount offered by anchors is large enough, consumers will have a strong impulse to buy. Promotion intensity is an important factor affecting consumers' impulse purchase intention. Promotion discount, especially time-limited promotion, is an important feature of livestreaming e-commerce and a factor that cannot be ignored when analyzing consumers' impulsive purchase in the context of livestreaming e-commerce.

7.3.2.2 Features of Anchors

In the virtual environment of the live broadcast room, as an important information source, anchors can have a significant impact on consumers' emotions. The characteristics of anchors that can improve consumers' pleasure and arousal are credibility, professionalism, attraction, and strong interactivity. When consumers watch the live broadcast of anchors with these characteristics, they are more likely to feel strong pleasure, concentration, and excitement, and then have the stronger impulse and make unplanned purchase behavior.

7.3.2.3 Live Broadcast Room Activity

When the number of viewers is larger, consumers are more likely to be influenced by the herd effect and follow the purchase. The activity of a live broadcast room is a new feature of live broadcast e-commerce which is different from traditional e-commerce. Consumption in the context of traditional e-commerce is a process of personal consumption, lacking of direct interaction and influence between consumers. However, the atmosphere in which consumers watch the live broadcast together is a very strong social influence. In addition, the live broadcast activity is also a voting mechanism for consumers' ability and trust in anchors. Anchors with

high activity are more likely to be favored by consumers, and consumers are more likely to make impulse purchases in such live broadcast rooms.

7.3.2.4 Pleasure and Awakening of E-Commerce Broadcast Room

When consumers feel strong impulse purchase intention, it is often driven by inner perceptual pleasure and perceptual awakening experience. At the same time, internal perceived pleasure and perceived arousal experience can also be affected by external stimuli. For example, attractive promotional activities, excellent anchors, and active live broadcast atmosphere can significantly affect consumers' perceptual pleasure and perceptual arousal, and other emotional experience.

7.3.3 Conformity Consumption

Conformity consumption refers to the consumption decision made by obeying the judgment of others, which reflects the manifestation of social influence. Social influence can be divided into informational influence and normative influence. Informational influence refers to the tendency to accept information received from others as a guide to simplify the decision-making process; normative influence refers to an individual's tendency to conform to others in order to obtain a sense of belonging or identity in a group and avoid being rejected by others. Consumer choice is influenced by information and normative factors. On the one hand, individuals are affected by cognitive constraints, time pressure, lack of information or information overload, and other factors in the decision-making process, so they cannot make rational judgments and trust information from others, thus maximizing decision-making efficiency. On the other hand, consumers long for a sense of belonging to a group so as to seek collective protection. Consumer participation in conformity consumption can be regarded as a psychological process. Compared with text and pictures, consumers have a higher degree of participation in videos, because visual cues can not only guide consumers to pay attention to product functions, but also generate emotional resonance with them. When faced with a compelling consumption experience, they are more willing to participate in it.

The virtual shopping space created by the Internet has changed the behavior pattern of consumers. Information technology has made online consumption more cooperative, dynamic, and highly interconnected. Consumers are described as social people whose individual decisions are susceptible to the influence of external relations. Generally speaking, consumers are highly dependent on the concept, viewpoint, or opinion in the social environment they are in contact with, and consciously or unconsciously conform to the group idea, so as to obtain psychological satisfaction. Social norms and interpersonal relationships are the antecedent of individual behavior intention, especially for domestic consumers who focus on collectivist behavior, social influence has a more significant impact on purchasing decisions. With

reference to group decision-making, consumers try to follow the decision-making behavior of others, and in the decision-making process, they show the behavior constrained by group decision-making. Group members tend to establish group norms, while individuals tend to follow their own group norms and change their behavior according to the social identity that the group wants to form for themselves. Once a large number of imitation behaviors occur, information cascades will be formed. In the case of information asymmetry, individuals are susceptible to the influence of predecessors' behaviors or information, change their cognition, and follow predecessors. In the context of network broadcast, consumers share their views, experiences, or opinions with anchors and others through bullet screen, thumbs-up, interaction, and gifts, creating a virtual immersive feeling. The virtual consumption space constructed by the live broadcast situation enables consumers to have a sense of co-presence and social presence, forming a temporary virtual interpersonal relationship, and individual decision-making is affected by the social influence of others in the virtual space.

7.3.3.1 Group Pressure Produces Convergence Psychology

Group pressure creates a convergence psychology

In the current communication model of the Internet, collective communication can be based on collective goals and collective consensus to achieve wide dissemination of information. Influenced by the webcast, consumers form a sense of "we" buying in the group, which forms their own herding behavior in group feelings and group affiliation. Under the influence of the network group shopping information environment, general users provide decision guidance for their own purchase behavior based on the purchase desire and purchase behavior of many people. At the same time, in the collective persuasion of the webcast subject, netizens form consumption tuning psychology and coordination behavior under the collective traction in order to reduce consumption rejection under the influence of social consumption behavior, which is the hope that netizens obey the consumption behavior of the masses in collective consumption and reduce the probability of consumption failure. The webcast makes full use of the collective pressure of the consumption layer to promote the consumption behavior of consumer users, i.e., it uses the collective power to promote the formation of the mass consumption psychology of individual users.

7.3.3.2 Symbol Consumption Builds Identity

Symbolic consumption builds identity

With the development of commodity economy, products with commercial value and market value gradually circulate and develop in the market. When consumers face these consumer products, they attach importance not only to the use value of the goods, but also to the commodity culture and concept formed behind the more commodities, which is to see the consumption of commodities as a symbolic consumption process. Users regard the goods in the market as symbols representing psychological and emotional changes, and the commodity consumption process is a consumption behavior formed based on symbolic interpretation. In the consumer market of Taobao live, consumers can interpret the connotation and meaning behind the symbols of goods, for example, in the consumption of lipstick and other related cosmetics, consumers tap into the lipstick's own style and grade through lipstick shape, pattern, cream shape, packaging and other factors while giving the connotation of high social status, social identity and self-taste to high-grade lipstick products. At the same time, webcasting as an emerging form of consumption can form the construction of commodity symbols and social meaning in the market-oriented trends and trends, specifically in the process of users' choice of goods, they can form the products and the sense of identity of self according to the symbolic consumption concept in the consistency of both to produce mass consumption behavior.

7.3.3.3 Discussion Leads to Collective Carnival

Collective discussion leads to collective revelry

Webcasting is a platform for mass consumers to discuss, communicate and consume, which can form a civil opinion platform with high discussion fever in the networked platform, especially nowadays the popularity of network communication makes the whole consumer market form an atmosphere of universal discussion and participation. The phenomenon of a wide range of users in the civil opinion can make users form a psychological identification with their consumption behavior. In the user's consumption behavior, first of all, the topic of live online causes relevant topic discussion, then in the increase of topic fever drives the masses to think about the consumer products, while the opinion leaders and the masses on the network platform to fully communicate after the formation of roughly the same knowledge and understanding. This is based on the secondary communication mode to build the corresponding collective discussion space, in the common field discussion to stimulate the discussion enthusiasm of users, so that under the influence of the entire public opinion field, through the collective discussion to form the shopping process of the herd mentality and herd behavior thus triggering the collective shopping boom in the online consumer market.

7.3.3.4 Internet Celebrity Economy Promotes Self-desire

Netflix economy gives rise to self desire

Led by the current network popularity economy, the entire network society has emerged as a kind of fashionista characterized by youthful beauty and high quality of life, who take their eyes as a benchmark for the popularity of network products thus gradually forming support for social network celebrities. Taobao's live events have many web celebrities live, but users in the process of watching the live broadcast, the personal image and quality of life of the web celebrities have a high desire, but also desire to have web celebrity-like market treatment and social value. Therefore, under the influence of market-oriented economy, the whole society shows a tendency to pursue a commodity-oriented economy. Specifically, individual users, under the influence of the marketing environment of the network platform and the large amount of information, produce a reflection on self-knowledge and self-worth, thus psychologically generating a desire for commercialized products under the influence of the networked economy thereby society forms a support for diversified products in the consumer market and mass consumption behavior.

7.3.3.5 Collective Behavior Forms Group Imitation

Collective behavior forms group imitation

Webcast activity is a collective behavior on the network formed in the environment of online marketing and popularity, especially the integrated behavior of consumption of products on the network formed by the market public under the influence of structural pressure and triggering events. In the process of information dissemination by the network communication subject, users are influenced by the collective implication mechanism, i.e., users accept the viewpoint of the relay subject in the process of indirect representation of the webcast subject, and consumers lose their judgment of the original nature of the goods and present a state of blind obedience. At the same time, users also form overall infection under the influence of collective suggestion, for example, the idea of "buy it" and "it's clean" quickly dominates users in the process of product purchase, and other users can also produce purchase behavior, thus forming a collective imitation consumption under the role of collective suggestion. Collective imitative consumption, under the influence of this kind of people's purchase boom, users in the shopping of personal instinctive impulse propaganda.

7.4 Summary of this Chapter

Since the 21st century, China's digitalization level, with digital technology as the core, has been constantly improving, and the digital economy has been developing rapidly. At present, domestic consumption behavior is deeply influenced by digital economy technologies such as big data, AI, mobile Internet, cloud computing, and IoT. The digital economy is changing online consumers' consumption content, habits, patterns, and even consumption concepts. This is the digital transformation of the traditional form of consumption, which to a certain extent stimulates the vitality of the market, expands the scale of domestic demand, improves the efficiency of consumption behavior, and promotes the development of the digital economy. However, it also brings many problems of inefficient consumption, among which impulsive consumption behavior and conformity consumption behavior are very common.

At the same time, the consumption in the era of e-commerce is not constrained by time and space, the fragmentation of the market is formed, and the consumption community is prominent. E-commerce consumption has gradually formed the scene, fragmentation, community, mobile, quality, and differentiation of six characteristics. The user-centric characteristics are increasingly prominent, and users are changing from passively accepting standardized products to deeply participating in product development and design and other product life cycle processes. Use AI, cloud computing, big data, and other technologies to establish a "customer-centered" marketing service system and push personalized value-added services to customers. The level of market predictability is constantly improving. The industrial Internet transforms heterogeneous and diversified data into standardized data applicable to the whole life cycle of products, conducts in-depth analysis on customer groups and user behaviors, promotes the accurate matching of supply and demand, and strengthens enterprises' market prediction and accurate marketing capabilities. Use the industrial Internet to build customized and flexible production and manufacturing systems, carry out production planning and optimal allocation of resources, achieve a dynamic balance between production and sales, and improve overall production efficiency.

7.5 Questions for Review

1. What is digital economy? Talk about your understanding of the digital transformation of the economy and society.
2. Briefly describe the specific performance of the consumption behavior in the consumption link of e-commerce and analyze its internal mechanism.
3. What are the changes in online consumption compared with that in the industrial age?
4. Based on the development trend of e-commerce, discuss how e-commerce should give full play to its advantages of precise connection with consumer

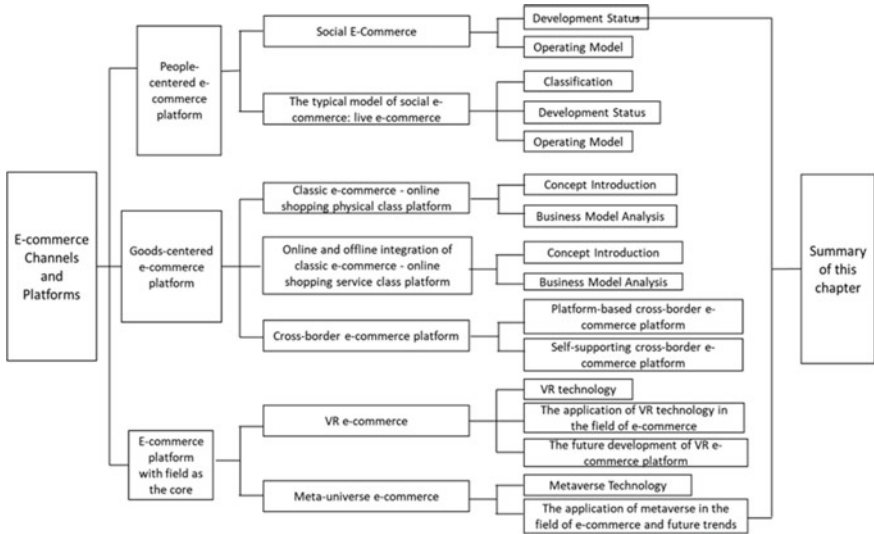
- demand in the future to serve the digital transformation, product innovation, and brand building on the supply side?
5. Talk about the influence that “meta-universe” will bring to the new form of e-commerce.
 6. What are the characteristics of e-commerce consumption? Please illustrate with examples.
 7. Briefly describe the performance of information fragmentation on the consumption level.
 8. Describe the opportunities and challenges brought by COVID-19 to the development of e-commerce, and analyze the development status and countermeasures of e-commerce in the context of COVID-19.
 9. Today, when the material life is fully satisfied, consumers’ demand for products is no longer confined to the traditional material level, which is generally reflected in the upgrading of product pursuit. Please combine examples to enumerate and analyze the factors that cause consumers to produce this change in consumer psychology.
 10. Briefly describe the hierarchy of demand of e-commerce consumers introduced in this book. Do you think there are other ways to divide the hierarchy of demand of e-commerce consumers?
 11. Talk about your understanding of consumers’ self-actualization needs.
 12. Try to analyze the internal mechanism of impulsive consumer behavior.
 13. In the era of e-commerce, how should e-commerce platforms and businesses make use of consumers’ herd consumption psychology for marketing, so as to promote the development and prosperity of e-commerce industry?
 14. Briefly describe the internal mechanism of forming group pressure of consumers.
 15. What is Internet celebrity economy? What are the effects of Internet celebrity economy on consumer behavior?

Chapter 8

E-Commerce Channels and Platforms



Knowledge Map of this Chapter



SHEIN, the Super Unicorn of China’s Cross-Border E-Commerce

SHEIN is an international B2C fast fashion e-commerce company, mainly engaged in women’s wear, but also provides men’s wear, children’s wear, accessories, shoes, bags, and other fashion products. SHEIN was the second most downloaded shopping app globally in 2021, with 190 million downloads, up 70% from 2020, according to app analysis platform Apptopia. SHEIN

has topped the download charts in both Apple and Google's app stores, even surpassing the global e-commerce giant Amazon. Thanks to its traffic-chic DNA, SHEIN also has a huge following on the Internet, with nearly 300 million followers on social platforms like Instagram, Facebook, and TikTok. SHEIN has more than 120 million registered users and more than 30 million daily active users (DAUs) on its own e-commerce platform. In addition, SHEIN's revenue figures are also very impressive, despite the impact of the pandemic, SHEIN's GMV last year was \$15.7 billion, or about 100 billion yuan.

There are three important factors to explore the success of SHEIN: price, flow, and supply chain.

The average price of SHEIN products is \$12, and there are as many as 600,000 products available for selection, covering clothing, shoes, cosmetics, home furnishing, and other categories, and 6,000 + new products are steadily added every day. SHEIN has significant advantages of low price, variety of styles, fast delivery, and online sales.

In the early days, SHEIN relied on social media to attract attention. In terms of traffic management, SHEIN has excellent online celebrity marketing growth strategies. As early as 2010, when the first batch of online celebrities with goods began to incubate in China, SHEIN seized the logic of traffic growth and invited KOL and KOC to try on the goods on Google, Facebook, Instagram, and Youtube in the European and American markets. Influencers can earn free items or commissions simply by Posting topics or video images related to SHEIN's products. The commission system fueled the fan economy and soon helped SHEIN carve out a niche in FMCG fashion.

The flexible supply chain behind SHEIN has to be mentioned as the powerful impetus for SHEIN's development. Thanks to its digital information supply system, SHEIN can make rapid adjustments in procurement, production, logistics, and sales according to the needs of end consumers.

Data show that SHEIN within a set of the intelligent design system, in the system, they will have the elements of clothing is very detailed, such as collars, cuffs, hem, color, such as different elements, under each of the elements, and produces various types of material, composition material database, as long as the designer a little bit change an element can be combined into a new design, accelerating the development of new products, which lays a foundation for SHEIN's rich products.

SHEIN also uses big data technology to help designers understand emerging markets by using algorithms to capture Trends on platforms like Google Trends. SHEIN know that lock can catch the hot style, produced after purchase, in data collection for the APP, and with the help of software and manual team, the competition site monitoring data makes SHEIN can first understand the development trend of competitors, consumers now want to buy what kind of clothes, etc., thus targeted design, choose and recommend, provide direction for product sales to ensure their leading position. It is understood that SHEIN

only needs 14 days for product design, plate making and shelving, and only 7 days for production and distribution to consumers after shelving.

SHEIN's digital manufacturing system also helps it iterate on a "day" basis. SHEIN not only promoted supply chain informatization internally but also built a digital manufacturing system for the factory. Factories can directly receive orders issued by SHEIN on the system. SHEIN can even control each worker on the production line through the system, assign tasks to workers, calculate workload, and pay wages, so as to realize the penetrating process management of factories and workers. SHEIN's supply chain center has also developed a feeding system that can better determine inventory levels to make reasonable replenishment decisions and minimize inventory pressure.

SHEIN has raised the industry ceiling by flexibly applying digital technology in production, sales, and management. Relying on the mature textile supply chain in the Pearl River Delta and the high-speed data feedback and design process, it has achieved a rapid response to market demand and become the super unicorn in China's cross-border e-commerce platform.

SHEIN is, as it were, the Chinese e-commerce company "people, goods, a" perfect combination model of both their own platform, also use a third-party platform, both PC and mobile terminal, at the same time, using a new generation of information technology, such as the big data and constant innovation, to build a complete industrial chain, form their own closed loop, which is worth our attention and research further.

Think about:

1. What is SHEIN's business model?
2. In addition to price, traffic, and supply chain factors, what other advantages does SHEIN benefit from to become the super unicorn of Cross-border e-commerce in China?

8.1 Human-Centered E-Commerce Platform

With the development of a new generation of information technology and the advent of the era of digital economy, the scope of the real economy using digital technology continues to expand, new business forms and new models continue to emerge, economic costs significantly reduced, efficiency significantly improved, industrial organizations and the real economy has been restructured, digital economy is booming. In the aspect of e-commerce, user-centered, the classical e-commerce link reorganization of "people", "goods" and "field" has produced a new mode of e-commerce in new forms. This section starts from the new form and mode of e-commerce, the human-centered e-commerce platform to

introduce social e-commerce, and introduces in detail the typical mode of social e-commerce – livestream e-commerce.

8.1.1 Social E-Commerce

8.1.1.1 Development Status

(1) Concept

Social e-commerce is one of the important forms of new e-commerce, which is based on interpersonal relationship networks and uses Internet social tools to sell goods and services. Social e-commerce refers to the process of better transaction completion by applying interaction, communication, discussion, sharing, interest, and other social elements into e-commerce purchase services through social network platforms or social functions of e-commerce platforms.

In general, the essence of social e-commerce is to rely on the collapse effect of the social chain to expand the scale of users and conversion opportunities. Social e-commerce has three core characteristics:

1. It has the effect of guiding purchase
2. There are interactive sharing between users or between users and enterprises, that is, there are social elements
3. Most importantly, there's a "multilevel payoff of social communication," Namely "SNS" spread, can profit.

(2) Development background and current situation

After more than 20 years of rapid development, China's e-commerce industry has developed. The transaction volume of e-commerce is huge, but the growth rate is gradually slowing down. The classic e-commerce industry has exhausted its dividends, e-commerce platforms, and stores are increasingly competitive, facing the dilemma of rising customer costs, and urgently need to find more efficient, lower, and stickier traffic sources.

In the era of the mobile Internet, social applications represented by wechat are widely used and become the main business entrance of mobile terminals. These social platforms take up a lot of users' time and have a high frequency of use, strong stickiness, and rich traffic value. From the perspective of promotion reasons, the advantages of social media communication are as follows: first, Social media has the communication effect, which can promote the transmission of purchase information and use the experience of retail goods in highly efficient and active social relationship groups. For users, information is provided by acquaintances, which makes the authenticity more reliable and the conversion rate higher. Second, the coverage layer of social media is more comprehensive, which can better supplement the user layer. The effective use of social media has brought new opportunities for the further development of e-commerce.

8.1.1.2 Operation Mode

Social e-commerce reconstructs “people, goods and places”: for people, social e-commerce achieves split communication through social networks, with users as purchasers and promoters. For commodities, social e-commerce is a decentralized communication network based on individual users, providing broad development space for long-tail commodities. For places, from searching shopping to discovery shopping under social networks, rapidly promote purchases and improve conversion rates.

Relying on social traffic, social e-commerce can operate more efficiently and at lower cost, from user updates to life-cycle preservation:

- (1) Introduce a new stage: rely on users’ social cracking to achieve growth and reduce customer acquisition costs.
- (2) Transformation stage: conversion efficiency can be improved based on acquaintance relationships with the help of trusted relationships. On the other hand, the refined operation can be realized by the natural structural differentiation of users through community labels.
- (3) Retention stage: users are both buyers and recommenders, and more user retention can be achieved in the secondary marketing process.

After these three stages, social e-commerce relies on social cracking to achieve efficient and low-cost import. Classic e-commerce traffic is transformed and reduced through the chain layer of “search browse”, “click view”, “order purchase” and “customer repurchase”, the classic e-commerce shopping mode (Fig. 8.1).

In terms of business communication networks, social e-commerce has unique advantages over traditional e-commerce. Classic e-commerce is a central shopping network. In the traditional “retrieval” e-commerce mode, consumers have unified traffic input, making online shopping “centralized”. When raw materials are in abundant supply, search rankings have a near-decisive influence on users’ choices. Under the Matteo effect, where flows are constantly concentrated in top commodities, small and medium long-tail traders are easily overwhelmed by a flood of commodities. In

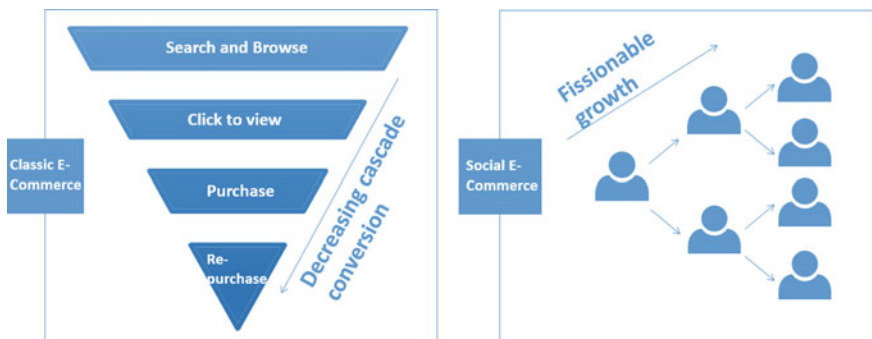


Fig. 8.1 Comparison between classic e-commerce and social e-commerce traffic models

social e-commerce, goods are distributed according to users’ personal distribution through links at the end of social networks, and each social node becomes the entrance of traffic. Social e-commerce, social e-commerce, social e-commerce, and social e-commerce is centered on the shopping network supporting social networks. Thus, the resulting transaction shows the structural characteristics of “centralization”.

In terms of users’ shopping paths, social e-commerce has the characteristics of discovery shopping and has the advantages of faster promotion of purchases and improvement of conversion efficiency compared with traditional e-commerce. Traditional e-commerce consumers have basic purchase objectives before shopping. They search for commodities through e-commerce platforms, search through multiple channels, and choose from many commodities displayed on shelves. Generally, consumers will make purchase choices based on the sales volume and word of mouth of the product, and it is difficult for the long-tail product to enter consumers’ attention. After shopping, consumers mainly share comments, and their desire to actively spread is not strong. The purchase conversion rate of traditional e-commerce is 0.37%. Consumers of social e-commerce usually notice interest in the social sharing and content drive, and the unplanned purchase demand is easy to stimulate the impulse consumption of consumers. After rapidly promoting the purchase of consumers, sharing desire can be actively conveyed under the drive of shared price and commission. Social e-commerce has a purchase conversion rate of 6–10%, and top influencer e-commerce has a purchase conversion rate of 20% (Fig. 8.2).

In the whole process of user shopping, the role of social e-commerce is mainly shown in three nodes:

- (1) Demand generation stage: stimulate users’ unplanned shopping needs through social sharing

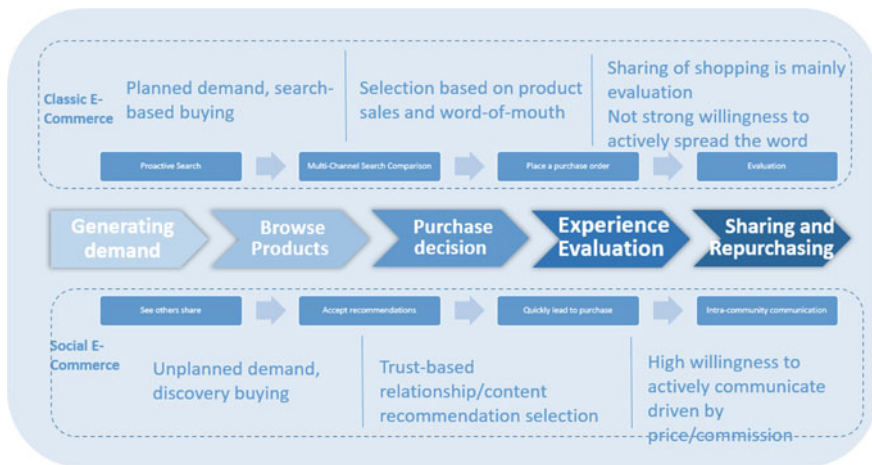


Fig. 8.2 Comparison of shopping paths between traditional e-commerce and social e-commerce users

- (2) Procurement decision-making stage: promote procurement rapidly through a reliable mechanism to improve conversion efficiency
- (3) Sharing communication stage: stimulate users' spontaneous sharing desire and reduce customers' acquisition cost

8.1.1.3 Classification

Social e-commerce according to the operation mode, traffic sources, target users, the commodity classification, respectively is live e-commerce, spell for social e-commerce, membership, group purchase, content class social live e-commerce book focus on e-commerce and spell for social e-commerce, live e-commerce is covered separately in the next section.

- (1) Procurement social e-commerce

Figure 8.3 shows the operation mode of purchasing social e-commerce.

- A. Market positioning: mainly price-sensitive consumers in low-tier cities. Through low patchwork patterns and rich game-type shopping experience, piece together classes social e-commerce at the same time meet the needs of the consumer social, leisure and shopping, relatively low-income level, leisure time more commodity prices high sensitivity line 3 and the following attractive city users, with the help of WeChat small programs, etc. convenient and fast shopping software. Group-buying social e-commerce has quickly attracted consumers in many lower-tier cities. Due to this differentiated customer positioning, purchasing social e-commerce is particularly prominent in the online shopping industry and is gaining momentum. Compared with the first - and second-tier cities, cities

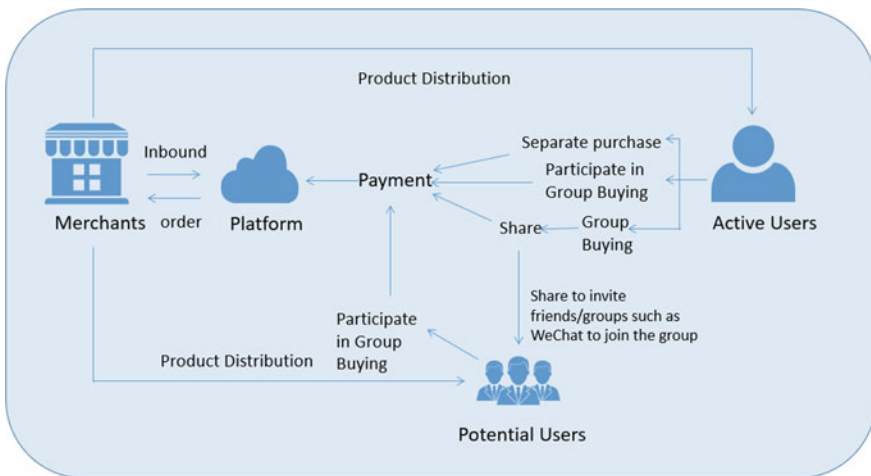


Fig. 8.3 Shopping social e-commerce model

below the third tier have a large population and relatively low penetration rate of online shopping, so there is huge room for growth in the future.

- B. Marketing mode: The patchwork mode guides users to share and reduces customer acquisition costs. Procurement of social e-commerce product design is “more benefits, more enjoyment” oriented, in the process of user shopping added many social and entertainment links, users can not get the maximum discount without in-depth participation. In order to get more rewards and concessions, users frequently participate in various activities and are willing to share with others. Users’ dependence on the platform and the participation of people around them are further strengthened. Rich gameplay increases user engagement and conversion efficiency and reduces customer acquisition costs.
- C. Product positioning: weaken the manufacturing of retrieval, reverse recommendation and direct link factory with low price. Regardless of the specific game method, low price is the key to attract customers to spread the purchase of social e-commerce platforms, the average customer unit price is much lower than traditional e-commerce platforms. Group-buying social e-commerce mainly focuses on daily necessities, clothing, and other popular circulation commodities with high consumption frequency, most of which are priced at less than 100 yuan. In the form of a group, a large number of users and orders are concentrated into a limited selection of gold blasting commodities without spending a lot of marketing costs. Abundant orders can attract many suppliers to join in, and the middle cost of the saving layer is broken while the price advantage of large-scale driving the cost of producers is reflected here. The low price of the product also becomes the key to attracting the user base, forming a downward cycle.

(2) Membership-based social e-commerce

Membership social e-commerce refers to a business model that connects suppliers and consumers in s2B2C mode on the basis of social networks and realizes commodity movement. Upstream distribution platforms connect commodity suppliers and provide a range of services such as supply chain, logistics, IT systems, training, and after-sales services to small B-end retailers, so the retailers are responsible for c-end commodity sales and user maintenance. Users become members by paying membership fees/completing tasks, etc. Without interfering with the supply chain, they use social connections to distribute, enabling “self-use, saving money and sharing” (Fig. 8.4).

Subscription-based social e-commerce is the update and evolution of wechat’s personal business model. In the first personal wechat business model, individual retailers must complete the whole process from raw material purchase to price and then to sales with a high threshold; violent screw-scrolling, brainwashing offline development, and fake and shoddy products in moments have also exaggerated public goodwill and trust, and wechat’s traditional business model has been widely questioned. In the membership-based social e-commerce model, retailers do not intervene in the supply chain, but only take responsibility for customer acquisition and user operations. The platform provides standardized services across the industry chain,

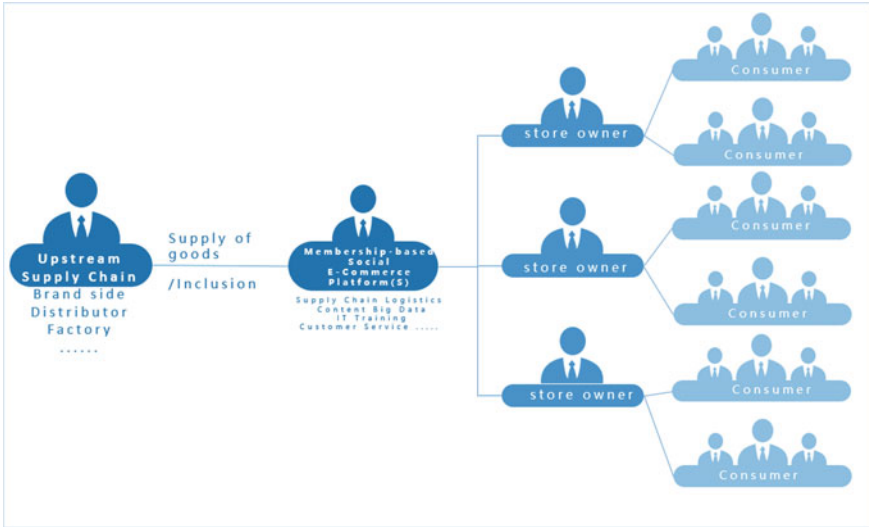


Fig. 8.4 Membership-based social e-commerce model in China

with retailers simply sharing revenue and providing advice. By establishing distribution mechanisms to encourage store owners to share and sell, the platform itself can focus on building supply chains and middle and back-office service capabilities.

- A. Distribution mechanism: layers of arbitrage, and campus fission brings customer dividends. Subscription-based social e-commerce platforms often build multi-level subscription systems. Membership levels and the number of titles at different levels vary across platforms, but the overall pattern is similar. In a typical three-layer model, for example: when consumers buy a subscription package or platform specified tasks finished, they can become regular members, and enjoy purchase discounts, sales commissions, and innovation awards: when the development reaches a certain number of sales and can be promoted to director, in addition to sales and innovation awards, still can get reward team performance: after upgrading to a service provider, service providers can also receive additional training incentives for promoting subordinate team leaders. The pyramidal cumulative profit model provides the foundation for the rapid expansion of the distribution system. From the perspective of customer acquisition, membership-based social e-commerce platforms can effectively reduce customer acquisition and maintenance costs of platform users through attractive promotion and reward mechanisms, and rely on merchants to carry out innovation and product promotion. On the other hand, member users (retailers) can also benefit from some price cuts when purchasing products on the platform, which can effectively increase the activity, engagement, and loyalty of the platform members.

B. Operation phase. The operation of membership-based social e-commerce platforms can be divided into two stages: in the initial stage, they usually aim at fast scale and attract seed members to join and split quickly through the explosive operation of reward mechanism and funds. However, the number of people with availability and distribution capabilities is limited. Through certain development stage, the fission ability of owner innovation is exhausted gradually, enter the bottleneck period. The revenue that owners can get from the platform will be shifted from innovation fees to sales fees. Early adopters need more goods to meet their diverse consumption and maintenance needs. The platform's main target audience is consumers. Only when enough orders are generated on the consumer side can retailers generate enough revenue to sustain their enthusiasm for distribution. The platform needs to expand its category coverage and achieve sustained business growth through a high-quality supply chain and refined operations.

(3) Community group acquisition

In terms of model, community group-buying also belongs to S2B2C e-commerce, mainly involving three parties: the community group-buying platform provides products, logistics, storage, and after-sales support, and the owner (usually BMW or the owner of the community store) is responsible for community operation, commodity promotion, order collection, and final product distribution. After community residents join the community, they place orders through wechat miniprograms and other tools. The next day, the community buying platform will distribute the goods evenly to the leader, and the consumer will pick up the goods or the leader will deliver the last kilometer (Fig. 8.5).

A. Core value: Knowledge economy reduces the cost of drainage

The core value of the community group purchase mode is mainly reflected in the following aspects: first, in the marketing mode, a single community is taken as the development unit and raw material sales are organized by BMW and community



Fig. 8.5 Analysis of group-buying patterns in Chinese communities

owners. Community residents are mostly acquaintances with a high degree of mutual trust, which can be spread spontaneously through word of mouth in the community to minimize the cost of acquiring customers; second, in terms of raw material supply, community groups form groups according to the links of raw materials and then organize the supply and distribution of raw materials. On the one hand, it gathers the needs of community users in the form of collage and improves the contractual force of the upstream supply chain through a large number of orders. On the other hand, the pre-sale mode makes the procurement more planned, almost can achieve zero inventory, to reduce losses; third, in terms of logistics mode, suppliers transport goods to the platform warehouse and directly send them to each community from the platform regional warehouse. Goods are distributed in the community as a whole. There are few intermediate connections, which can significantly reduce losses. The group leader is responsible for the last kilometer, and the automatic lifting mode is usually adopted, which can effectively control the logistics cost of the terminal.

B. Settlement: Fresh food and other raw materials

The community group buying platform mainly uses fresh food as a channel to reduce the daily consumption of community residents. Fresh food accounts for about 30 percent of most community group-buying platforms. Fresh food, as a kind of consumer good with high frequency and high repetition, is a kind of natural flow product, and it is easier to create a single popular product. Through a pre-sale system and centralized collection points, community group buying can effectively reduce working capital, reduce distribution and storage costs, and improve the efficiency of the fresh food supply chain. In order to make full use of the community group-buying model, the sales volume of a single product and the distribution density in the same region need to reach a certain scale, so as to improve the premium ability of the platform to upstream suppliers and effectively reduce the distribution cost. As a result, community group-buying platforms usually do not sell a variety of products for a long time like other e-commerce platforms, but adopt a new model, select about 100 products a day for centralized recommendation and sales, and create explosive products. On the one hand, this approach can focus the needs of community consumers for the same product on the same day. On the other hand, daily product updates can cultivate hunger through “notification + time limit”, attract customers to visit every day, and improve user compliance and repurchase rate.

(4) Content social e-commerce

Content social e-commerce refers to an e-commerce model that guides consumers to shop through various forms of content, realizes the coordination between goods and content, and improves the marketing effect of e-commerce (Fig. 8.6).

A. The core of this mode is: rich content, implementation form, and deep link between platform and users

In content, rich implementation form. For e-commerce platforms, establish deep links with users. Social content e-commerce attracts users through a variety of formats, such as photo posts, live broadcasts, and short videos, as well as shopping-related

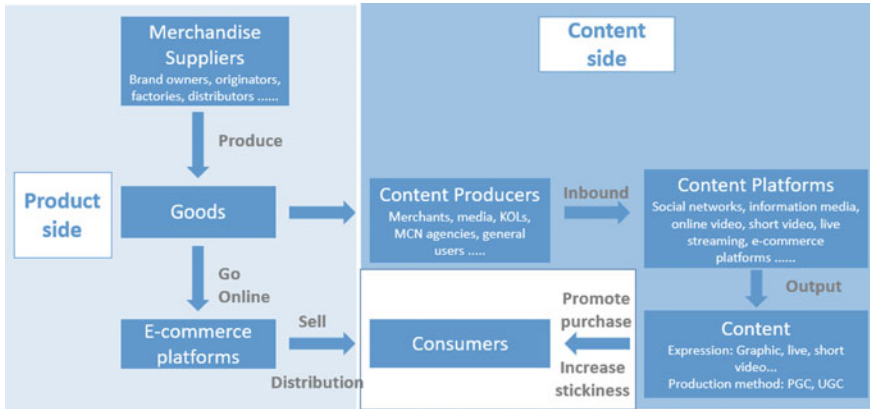


Fig. 8.6 Content social e-commerce supply chain in China

content communities, such as buying and sharing shopping guides. When viewing the content, users can purchase it directly on the platform or switch to an e-commerce platform via a link. After purchasing an item, some users will use their own content and share it on the platform, further enriching the platform’s content, thus forming a closed cycle of discovery, purchase, share, and discovery. The combination of content and e-commerce establishes a deep bond of high stickiness between featured products and users, which can effectively improve user stickiness and conversion rate.

B. Focus on development: the marketing value of short videos is prominent and has become the focus of the platform layout

High-quality content is playing an increasingly important role in attracting users and improving conversion rates on e-commerce platforms. In many forms of content, short video has attracted more and more attention due to their outstanding characteristics such as wide adaptability, large carrying capacity, and strong communication ability.

The value and characteristics of short video marketing:

1. Flexible production, widely used. Short video content has a short production cycle and low cost. Therefore, it is more flexible in marketing form and can meet the needs of different types of marketing.
2. Large content transmission capacity and rich interaction. The information transmission capability of short video content is rich and concentrated, which can concentrate a large amount of marketing information into various forms of short content programs. At the same time, it has the interactive property of social media and can establish a deep communication relationship with users.
3. Spread characteristic: fat tail effect. Often, the number of short videos far exceeds the number of fans. High quality content in the head can go viral and have high quality performance in terms of potential and explosive marketing value.

Table 8.1 Social e-commerce by content category in China

Type	Commodity driven	Content driven	Product + content driven
Nature	E-commerce platform content	E-commerce content platform	Content + e-commerce dual wheel drive
Content operation mode	Most act as platforms to connect disparate content creators and MCN content organizations	Most are self-built content teams that produce and distribute content as MCN organizations	Most of them are self-built content production teams + connected with external network celebrities and MCN content agencies
Commodity operation mode	Mainly self-run + platform	Shopping guide + platform based	Mainly self-run + platform
Bottleneck	Lack of quality content Content distribution channels are relatively limited	<ol style="list-style-type: none"> 1. Lack of e-commerce supply chain, limited commodity richness, and difficult to guarantee quality and service quality 2. Improper operation when adding commercial content is easy to make users feel bad and overdraw brand credit 3. Audience size is easily limited by its fan ceiling 	It is difficult to operate the content production and product supply chain

Content social e-commerce can be divided into three types: commodity driven, content driven, and commodity + content driven. The following table makes a detailed comparison of these three types (Table 8.1).

8.1.2 *Typical Mode of Social E-Commerce: Livestreaming E-Commerce*

8.1.2.1 Development Status

After three years of rainfall from 2016 to 2018, live streaming e-commerce became popular in 2019. Live streaming has become a common way for the platform to extend users' time and improve marketing transformation. This popularity quickly fostered a

new ecosystem, and the industry quickly shifted from simply capturing transportation dividends to capturing dividends across the entire ecosystem, especially through the smooth operation and penetration of supply chains. In 2020, the number of enterprises and employees providing live streaming e-commerce services will grow rapidly. In 2020, the size of China's direct-broadcast e-commerce market reached 1.2 trillion yuan, with an average annual growth rate of 197.0%. With the further expansion of the scale of Internet users in China, consumers' in-depth understanding of the interactive, social, and interesting nature of live broadcast and delivery provides audiences with better prices, more intuitive introductions, and greater confidence. The acceptability of users of network broadcast and e-commerce live broadcast has gradually increased, the average daily viewing time of users has continued to increase, the overall proportion of e-commerce live broadcast users has increased significantly, and more and more people have realized how to purchase goods in the direct broadcast studio. Live broadcasting has become a normal marketing mode and sales channel in the e-commerce market.

People's simple understanding of livestreaming e-commerce is "online + livestreaming + e-commerce", which is a new form of commodity channel developed on the basis of video interaction. Basically, it's a channel format. In addition, it is a new form in the development of online channels such as e-commerce.

The core of real-time e-commerce is e-commerce. Livestreaming is an innovation of e-commerce channels in order to seize the market, expand customers and improve the consumer experience. Livestreaming can make the communication between enterprises and consumers jump directly from the initial text information and commodity images to visual media. The turning point of this channel format reform lies in the emergence of the anchor role of network celebrities, which brings media, entertainment, culture, life, and many other new elements into channel promotion and brand building. It features online interaction, hotline connection, vividness, scene, personality, entertainment, emotion, and experience to update consumers and participants.

Therefore, when you understand live e-commerce, you must avoid two misconceptions:

1. Don't "focus on livestreaming but ignore e-commerce". The main body of live streaming e-commerce is e-commerce, not red or online streaming. The function and function of red online streaming cannot be exaggerated.
2. Don't "put form over content". "Live broadcast" is always a form and tool. The core is the commodity and e-commerce itself, including the characteristics, quality, and service of the commodity. We cannot unilaterally exaggerate the personal value of Internet celebrities and the power of live broadcasting.

8.1.2.2 Mode of Operation

(1) Basic introduction

The diversification of brands promotes the rapid evolution of the types, forms, and delivery modes of livestreaming e-commerce. At present, a mature model has been basically formed for livestreaming e-commerce.

In terms of the form of livestream e-commerce, it can be divided into master broadcast and enterprise self-broadcast: master broadcast means that the merchant invites the third party master with professional knowledge, personnel, and set fans to hang links in their livestream room and sell them together with other products. Talent communication is suitable for the application scenarios of new product promotion, covering new target groups, with a short time and long planning cycle; corporate self-communication refers to the enterprise facing the audience, independently constructing or inviting a third party to operate, opening a direct broadcast room for its platform or store, and using one or more of its own accounts to spread its products and deliver goods. Self-produced enterprises are suitable for normal live streaming in stores, traffic transformation in private domains, and long-term and short-term planning periods. Enterprises pay more attention to self-diffusion and develop stable and durable transport channels.

In terms of cargo grouping mode, master broadcast can negotiate with different brands about the appearance order and exposure time of different products according to product category, tonality, function/efficacy, price, etc.

Live broadcast can be divided into the following four categories (Table 8.2).

The process of a simple live broadcast is: attracting investment and selecting products—formulating strategies—broadcasting on—reproducing. The threshold of these processes is not high, but they involve multiple details and are interlinked. Therefore, the control of details and fine operation have become essential basic elements, such as selecting products involving user trust and institutional goods pool. The key point is the professionalism of the team. In-depth understanding and market analysis of price, brand, category, and style, as well as how to combine popular products, popular products, profitable products, and regular products, also directly affect the subsequent promotion strategy, script writing, and live broadcast effect.

Table 8.2 Classification of live broadcast forms

Live form	Introduce
Tutorial interpretation class	Explain beauty fashion products, 3C digital products, efficacy/function products
Good things to share	Feedback fans, cost-effective products
New preheat class	New product promotion, brand promotion
Official activities	Cooperate with platform activities to hit the list

(2) Supply side

Livestreaming e-commerce revolutionizes supply chain, shortens supply chain links, reduces information gap, improves information feedback speed, and realizes deep cooperation and win-win situation through more real, accurate, and stable demand feedback.

In production and marketing, real-time e-commerce shortens supply chains. Real-time e-commerce can skip intermediaries and connect factories and consumers directly. Reducing links can shorten the feedback time and narrow the information gap, while helping brands explore and reach potential consumer groups. Meanwhile, live streaming is an interactive, flexible, and fast way to sell in real time. Anchors exercise their right of choice on behalf of their fans. The real-time dissemination results of individual products can be quickly reported to the end of production, indirectly accelerating the survival of the strongest products in the industry. Meanwhile, anchors need abundant and high-quality SKUs to support the frequency and attraction of live broadcast, which forces the supply chain to improve the response speed and increase the frequency and number of new broadcasts (Fig. 8.7).

In the performance of the contract, warehouse integration demand increased. The shipping feature of livestream e-commerce is fragmented orders, which provides an applicable scenario for the efficient warehouse and distribution integration mode. According to the expected order quantity, goods are prepared in RDC warehouses in many places in advance, and the nearby rapid delivery reduces at least one transshipment and distribution. With the improvement of the digitalization degree of supply chain and prediction accuracy of the demand side, offline stores can become pre-warehouse, and the integration mode of warehouse distribution will be more popular. At the same time, the growth of live broadcast orders for fresh products promotes the development of cold chain transportation, and more live broadcast

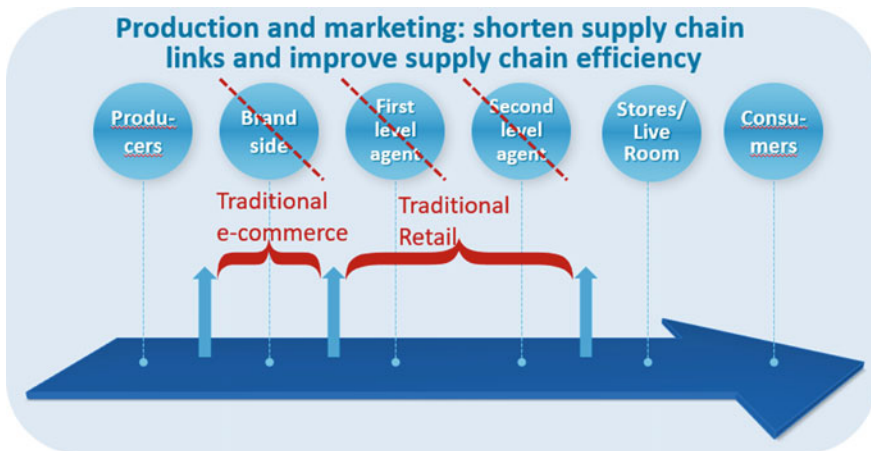


Fig. 8.7 Transformation of production and marketing of livestreaming e-commerce

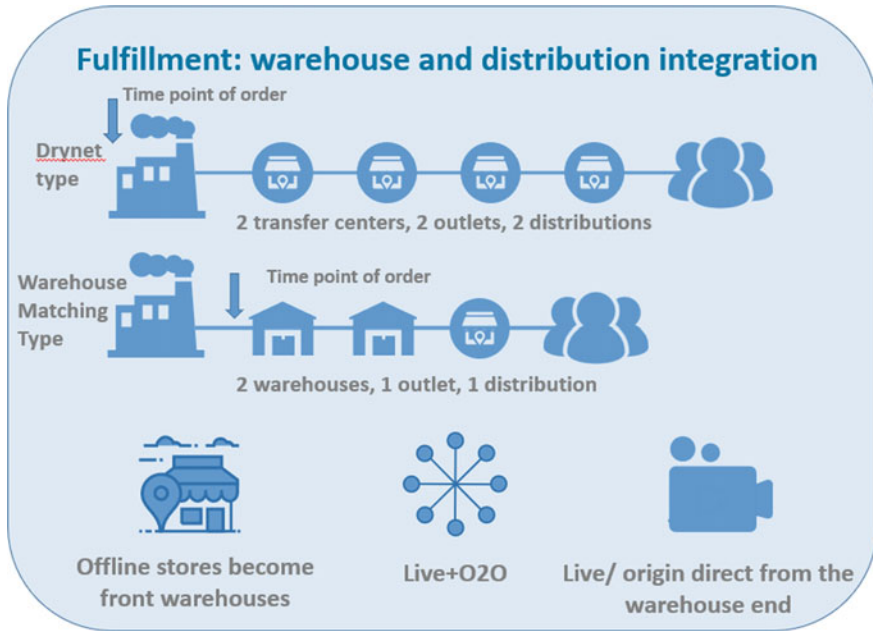


Fig. 8.8 Implementation reform of live broadcast e-commerce

rooms and warehouses are located in the place of origin to ensure the quality of products (Fig. 8.8).

For the front-end guidance of production, C2M mostly uses big data insight + experience + demand feedback to predict trends and opportunities. However, due to the explosion of centralized data, the period of data collection and analysis is greatly shortened (12–14 h), and the availability and conclusiveness of data are stronger (such as timely suspension of production in case of poor sales of broadcast rooms). Meanwhile, based on the massive selection experience of anchors and operators and the collection and real feedback of broadcast users’ demands, it can more flexibly and accurately control the matching of R&D and design with production and marketing. As a result, livestream e-commerce can provide more rapid, accurate, and real insight into front-end consumers.

Livestreaming e-commerce has huge and stable demand, so it can realize the mode of the sale first and then production. Livestream e-commerce provides the best sales scenario, especially for explosive products. The livestream room has anchors as trust endorsement and a fixed fan base with high repurchase and high conversion, which can promote a large number of orders in a short time. With the guarantee of sales, although users have not placed an order, they can feed back the order quantity and schedule to the upstream before the live broadcast. Manufacturers can reverse the production cycle and produce according to demand. Meanwhile, intensive orders and raw materials negotiate prices to reduce production costs, minimize inventory risks and improve profits.

Livestreaming e-commerce can produce deeper and longer-lasting cooperation with upstream, forming a positive cycle of on-demand production and win-win situation among the three parties. Livestreaming e-commerce companies have more real, rapid, accurate, and stable demand feedback, and anchors have efficient matching teams to help brands share performance obligations and after-sale tracking. On the other hand, anchors have strong bargaining power, and their understanding of the cost structure of the industry enables them to make more reasonable pricing adjustments. Consumers enjoy high-quality products with high-cost performance, and factories ensure reasonable profit margins, benefiting both ends of supply and demand. Livestreaming e-commerce companies have closer long-term cooperation with upstream producers.

(3) Demand side

The combination marketing of “text and text + short video + live broadcast” has more and more important value. E-commerce platforms continue to increase the proportion of live broadcast and graphic e-commerce, constantly shorten the access path between live broadcast and mall, and increase the search function and comment function to provide users with an immersive experience and a more convenient and user-friendly shopping conversion path. This kind of change shows that “text and text + short video + live” immersive browsing has become a necessary online shopping guide scene. Information acquisition and purchasing decisions have moved to more personalized and content-oriented short videos and live broadcasts. In the decision-making path, there are also great differences among the three types of content: pre-purchase cost of users (including access cost and decision-making cost): live broadcast < short video < text and text. The single conversion rate of live broadcast shopping is higher than that of short video and text and text.

Consumers of electronic commerce pursue the maximization of cost efficiency and promote the improvement of product quality and effect. From the user's point of view, both high-speed city users and users of crowded markets, goods, and prices are the main drivers of on-site shopping. There are a large number of price-sensitive consumers in online shopping, and it is their common aspiration to reduce premium prices and has good quality and reasonable prices, thus creating an incremental market for livestreaming e-commerce. The strategy of livestreaming e-commerce companies is shifting from low-price dumping to the penetration of cost-effective products, and users have no knowledge of a large number of mature brands. In the future, it will lose its competitive advantage to carry out live broadcasting for the purpose of clearing inventory. In the future, the key is to cultivate users' live broadcast consumption habits and tap the resulting demand, so there is a high growth space for products with a high cost-performance ratio and quality/price ratio.

(4) Service providers

With the gradual improvement of the ecosystem of livestreaming e-commerce industry, more and more service providers are participating in the construction and competition of the industry in different ways. According to different business priorities, service providers can be divided into investment promotion service providers,

agency management service providers, training service providers, supply chain service providers, MCN institutions, industrial belt service providers, etc. According to different scenarios, it can be divided into file port live broadcast service providers, village broadcast service providers, etc. At present, in addition to master broadcast and shop broadcast agencies, the boundaries of other types of service providers are still relatively fuzzy. On the one hand, most service providers provide comprehensive solutions. On the other hand, service providers will have different focuses in the future.

As one of the two major formats of e-commerce live broadcasting, master broadcasting is adopted by businesses for its professionalism, high traffic, and high conversion rate, which can bring traffic to brands in a short period of time and increase sales. However, short-term traffic is loyal to the anchor, which is a gradual increase in sales. Since 2019, more and more companies use the enterprise since the spread (propagation) store, the proportion of store broadcast is increasing year by year, businesses through the real-time interaction with customers, to provide targeted services to help consumers make buying decisions, to gain consumer loyalty to the brand. Businesses can get more controllable costs of investment and more stable sales growth by normalized shop broadcast.

Daren Broadcast has a strong IP attribute: it uses Anchor as a hub for mixed delivery, with companies collaborating with Anchor on a per-domain basis. In the in-store broadcast mode, enterprises and in-store broadcasters cooperate for a long time to focus on in-store customers and broadcast live regularly throughout the year. For long-term cooperation, in-store transmission is primarily the responsibility of the committee. At the same time, due to different audiences, the anchoring of talent communication has a strong IP attribute, so the conversion rate and return rate are higher than store communication.

(5) Core competitive elements

As for the live streaming e-commerce platform, most content platforms have been able to form a basic trading closed loop. The final key competition between platforms is the construction of the live streaming e-commerce ecosystem, which not only provides optimal docking and integration for all parties in the industrial chain but also goes deep into the transformation of the industrial chain and becomes a full-link enabling platform. Live broadcast electricity ecological construction is the key to the business of the tilt of the resources and the allocation of resources, which include the establishment of and live, merchants, belt, and the linkage of the local government and its own live on ecological construction, to provide professional facilities and services, provide exclusive solution and diversified cooperation opportunities, make up for poor information of different parties and business, to achieve efficient docking of all participants and optimal integration of resources. For example, policy support such as financial subsidies, promotion of exclusive services and activities, efficient matching of big data, and upgrading of supply chain with big data, etc.

Supply chain management capabilities have become a key competitive factor for MCN platforms, especially for institutions with strong anchor matrices, where supply chain selection and aggregation capabilities ensure brand and supply chain

anchoring effects. At the same time, authorization and control of all upstream design, manufacturing, and distribution links have become the next growth point for value-added services in the supply chain. Livestreaming is just a form of marketing, and its main competitiveness still revolves around raw materials and the supply chain itself. Including the ability to effectively match, select and combine anchor parts and raw materials, cooperative resources, and bargaining power, as well as the ability to control the entire design and production of products and sales channels of independent brands. In this process, MCN organizations must integrate supply chain resources for different types of raw materials to meet the raw material demand and price demand in the context of high-frequency live broadcasting. On the other hand, to ensure the supply of goods and transport effect.

8.2 E-Commerce Platform with Goods as the Core

8.2.1 *Classic E-Commerce—Online Shopping Object Platform*

8.2.1.1 Concept Introduction

The most common type of classic e-commerce is an online shopping platform. The entity online shopping platform is an online payment-type store promotion module. It is in the form of opening a commodity store through the platform and then putting commodities on the shelves. Customers place orders and pay online or pay on delivery, sign and receive payment, among which the type of goods is physical, tangible products.

Tangible goods are physical objects that are transferred from one institutional unit to another through trading in the market for which demand exists and ownership can be established. Parry and other scholars summarized the main characteristics of tangible products as entities that exist independently of their owners and maintain their identity through time. Tangible products (PT), also known as tangible products or form products, are able to meet the needs of consumers and have solid products (concrete form), and are the carrier of product core value.

8.2.1.2 Business Model Analysis

The classic e-commerce is to achieve online transactions on the e-commerce platform through the Internet. Mall, consumer, product, and logistics are the four elements of traditional e-commerce. Merchants display product information through e-commerce platforms to provide high-quality and inexpensive goods. Consumers on e-commerce platforms can search for merchants, browse products, and place orders for targeted products through price consultation. E-commerce platforms attract merchants and

consumers, promote merchants to settle in, guide consumers to buy, and promote transactions. After the transaction is concluded, the logistics service provider solves the problem of product transportation and distribution and delivers the product from the merchant to the consumer. After receiving and confirming the goods, the payment service provider will solve the problem of cash flow and settlement. The traditional e-commerce transaction process is shown in Fig. 8.9.

With the popularization of the Internet and computers, e-commerce has achieved worldwide life and universalization, and online shopping is no longer a synonym for fashion avant-garde. With the improvement of living standards, consumers have more expectations for shopping, and their requirements for consumption activities are no longer limited to the price and quality of goods. More and more consumers hope to obtain good service and pleasant shopping experiences. This also forces e-commerce enterprises to expand from the original price competition to service competition. In order to gradually become the leader of China's e-commerce industry in the fierce competition of e-commerce industry, online shopping physical platform needs to benefit from the dividend and policy support of the times on the one hand, and also needs to benefit from the platform's own reasonable business strategy and development concept on the other hand.

The products sold on the shopping platform of the classic entity e-commerce network are promoted through the online platform. From the goods on the shelf to the purchase process, the purchasing behavior of consumers becomes a funnel. In

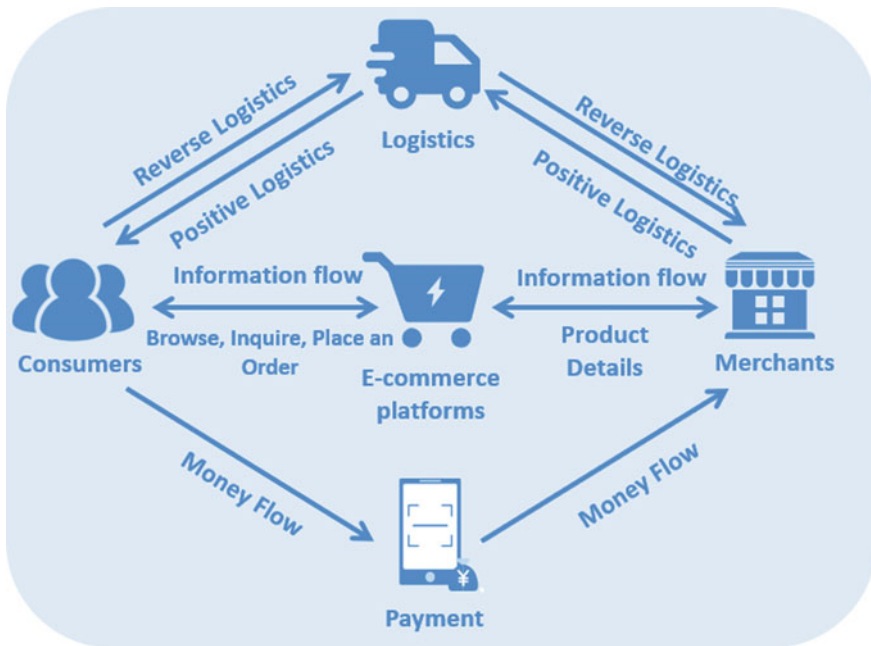


Fig. 8.9 Traditional e-commerce transaction process

the process of consumers' consumption, it is through the seller to decorate, modify images, identify and convey goods, and communicate with simple language. In managing the store, the proprietor must invest a considerable amount of energy and money. Goods cannot be fully displayed efficiently, and there is little to compete with. Through the store's excellent decoration, can open a certain amount of traffic.

Accurate business positioning and appropriate business strategy are the premise and foundation for the steady development of e-commerce enterprises. Since the rise of e-commerce, many B2C e-commerce platforms have been active in China's e-commerce market. In the market, in addition to the competition of Chinese local enterprises, there is also the impact of foreign e-commerce giants. Compared with integrated B2C mode, vertical B2C mode has obvious advantages. First of all, from the perspective of operation, the requirements of the integrated B2C model for commodity types are much greater than that of the vertical B2C model. Vertical category B2C only needs a single category of goods, and comprehensive category B2C needs multiple categories or even the whole category of goods. Secondly, from the perspective of management, the integrated B2C mode is much more difficult to manage than the vertical B2C mode. In the integrated B2C mode, all kinds of goods have great differences in performance, quality, service, and transportation, which requires a more extensive and professional management and service team. In the vertical B2C mode, due to the single product type, the same or similar products have similar management and service, so the management cost is relatively small and the management is relatively simple. Finally, from the perspective of the supply chain, the integrated B2C supply chain is more complex. There are many kinds of commodities in the comprehensive B2C mode, so the number of merchants and enterprises is also large, which makes it difficult for merchants to choose and integrate resources. However, the vertical B2C mode with a single product type is relatively simple in the selection of merchants and integration of resources.

A large physical online shopping e-commerce platform in China focuses on the precise commercial positioning of vertical B2C business, which enables it to quickly occupy the market in the 3C field and accumulate quite rich experience in e-commerce operation. On this basis, the platform began to apply the operation concept and experience in the 3C field to the sales of other categories of products, and then changed to the comprehensive B2C model. At present, the construction of its comprehensive B2C model is successful. Through a strong supply chain, technology and marketing capabilities, the platform's B2C self-operated mall has completed the full range of products including computers, mobile phones, household appliances, consumer goods, household appliances, fresh food, life services, and industrial products, with millions of SKUS (inventory units) of self-operated goods.

A promotion strategy is the most common marketing method in e-commerce. The core of network marketing is to strengthen the emotional communication and cultural exchange between enterprises and consumers, dilute the profit intention of commercial activities so that consumers feel and recognize their own interests. However, advertising and hard selling in traditional business often cause consumers' discomfort or even aversion. In recent years, online sales promotion of online physical goods e-commerce platforms is very frequent and popular. In the middle and end of

each year, large shopping festivals, store celebrations, and small shopping festivals of each platform, for example, sales promotion activities are carried out during the back-to-school season, Mother's Day, Father's Day, and other festivals and important points. Network promotion activities in various ways have gradually become a consumer culture and become an important "festival" for consumers shopping. This promotional culture has largely diluted the commercial nature of e-commerce enterprises, and thus narrowed the distance between enterprises and consumers, making consumers more trust and rely on e-commerce enterprises.

In addition, some online physical goods e-commerce will also establish their own logistics system to improve distribution efficiency and attract customers. Advantages in warehousing, distribution, and service have become one of the core competitiveness of a large domestic online shopping entity. The platform has launched a series of delivery services such as time-limited delivery, next-day delivery, next-day delivery, and extreme speed delivery. For e-commerce, especially self-operated e-commerce, powerful storage capacity is the basis and guarantee of commercial activities. At the same time, efficient and safe logistics are not only a strong guarantee for enterprise production but also an important support for commodity sales. From the perspective of consumers, the service and efficiency of logistics directly affect consumers' shopping experiences.

8.2.2 Online and Offline Integration of Classic E-Commerce—Online Shopping Service Platform

8.2.2.1 Concept Introduction

The online shopping service platform is a classic online and offline integration of e-commerce. Products and services provided by offline merchants can be obtained online. An online shopping service platform is also equivalent to an information sharing platform, and its value demand is to provide relatively accurate and objective offline service information under the environment of information asymmetry. The offline company information provided by the platform is mainly the user's experiential comments on the company's products and services. Among them, the commodity type is intangible service and product.

Intangible products are mainly service products, which are the result of transforming material resources into intangible forms with value and use value, including digital products and information services.

8.2.2.2 Business Model Analysis

The model of the online shopping service platform is mostly the O2O model. Among the online shopping service platforms, some platforms start with group buying and attach great importance to the transaction. Their income comes from deduction points. Other platforms tend to divert attention, mainly advertising. With the development of the industry, the e-commerce platform of online shopping services has developed from the initial split to integrated development, which also marks that the O2O model of the industry has entered the optimization and integration period. After the merger, diversion, and marketing is the focus of the characteristic development mode of the online shopping service platform.

(1) Business integration and innovation

A. Technical conditions

E-commerce often has a complete repository of platform data for mobile applications. From design to operation, from online to offline, from businesses to users, O2O is more inclined to broad platforms and intelligent advanced technology. The former affects the ecological competition of the industry, while the latter is the accumulation of talents and technology in essence.

B. Product and service optimization

The content of local life service industry is broad, including education, beauty and fitness, film, hotel, catering, and other fields related to daily life. With the development of O2O market, the products and service types of online shopping service platforms are increasingly diversified, expanding from high-demand and high-frequency fields such as hotels, movies, takeout, and catering group purchases to low-frequency fields such as home decoration, marriage, education, and medical treatment, which are in pursuit of higher quality and higher unit price. At the same time, it also excavates the demand of surrounding tourism and domestic and foreign tourism which is closely related to the local life service industry.

Under the O2O model, we pay attention to the integration of existing enterprises and product series innovation in terms of product and service optimization. To consolidate benefit, deepen the business positioning, improve industry barriers, online service platform to launch the business reception, internal management, and cost control, integrated services, innovative online service platform of the industrial structure, enhance the value of individuals, enterprises, and traders, optimize the ecological environment, extend business chain, enhance the competitiveness of industry.

(2) Online and offline diversion and marketing

A. Split link

The O2O model emphasizes the combined effect of online and offline distribution. Online shopping service platforms promote the flow of people from offline to online,

improve customer recognition and satisfaction, while maintaining the stability of primary and secondary customers. The migrant population will be concentrated in the third and fourth-tier cities, and the traditional marketing media will scan the QR code to guide consumers to install mobile apps, supplemented by preferential online activities to improve consumer knowledge and cultivate consumer habits. In the process of network diversion, online shopping service platforms pay more attention to social platforms and split applications and make use of the social aggregation effect to increase traffic. Through the combined online and offline distribution, business opportunities can be transformed into sales opportunities, and the flow of people can be better transformed into customer flow and customer flow into cash flow.

B. Business links

In O2O mode, online marketing is mainly integrated through offline marketing. The online shopping service platform integrates, analyzes, and evaluates the big data accumulated by itself and the data from the third-party platforms to achieve point-to-point and precision marketing. In a cloud computing environment, cloud computing provides technical support for big data processing to capture horizontal and vertical data. In AI, the market environment changes from macro to detailed, forming precise quantitative data. At the same time, it is more conducive to the promotion of the business market so that the platform itself can obtain a larger market share. Bring great convenience for marketing decision-making, directly improve the platform trading volume, and enhance the competitiveness of the industry.

(3) Value proposition

Online shopping service platform mainly aims at local raw material consumption and service experience, focusing on life service. The content of the site is built through user reviews. On the one hand, it attracts users to participate in shopping activities, and on the other hand, it improves users' consumption experience. On the other hand, it intuitively transfers consumers' after-sale feelings to enterprises and improves their products and services in time. The value proposition of the comment method is that the comment information comes from the user and serves the user.

(4) Channel access

Online shopping service platforms have multiple channels to convey their value propositions to consumers, including: 1. Direct sales to reduce physical stores' dependence on geographical location and gold stores, expand commercial areas and reduce rental costs; 2. Membership system, users must register on the website, provide rating information, and improve the maintenance and marketing ability of old customers; 3. Cooperate with social networks, release various group buying and preferential activities launched by the website in the form of a circle of friends and friends' attention, and improve the popularity of the website; 4. Bundling mobile customers to further expand the user base; 5. Put TV advertisements or websites in subway stations and other public places to strengthen advertising and form brand association among consumer groups.

(5) Customer relationship

The relationship with the customer refers to the relationship type established with the customer's target market segment, which is divided into five types: basic, passive, responsible, active, and partner, aimed at improving and obtaining lasting benefits. Generally speaking, at the beginning of the establishment and operation of an online shopping service platform, the relationship with customers is passive, that is, after the seller sells the product to the customer, if the customer has problems or opinions after the sale, the seller accepts or encourages the customer to contact the company. The online shopping service platform launched the comment mode to encourage consumers to publish their consumption experience on the website after group purchase, share it with other users, contact merchants in time, and improve after-sales service. The online shopping service platform constantly adjusts its relationship with customers and gradually develops in a positive direction. That is, after the completion of sales, the platform keeps in touch with customers in various ways to understand their after-sale feelings and provide new product information. Publish consumer questionnaires on the website or cooperate with other third-party websites to publish advertisements. Cooperate with social networking websites to promote consumers to update the information of preferential merchants and update activities of website construction. The platform can make full use of the existing customer network for customer relationship marketing, and carry out discount activities for marketing promotion, such as inviting friends to buy and returning small amounts of money. People can introduce online shopping service platforms to many people through these platforms and then spread the word through these people. Every time an old member successfully introduces a new member, they will automatically receive a small cash prize.

(6) Profit model

Online shopping service platforms mainly have three ways of profit: one is to earn advertising fees through promotional activities, the other is to obtain commission trading commissions through group buying activities, and the third is to obtain information income through wireless value-added services.

- A. Commission income. The European Commission's model of online shopping service platforms benefits from the consumer intermediary platform established between users and traders. The first step is to sign a contract with the catering service provider to realize the intention of cooperation. The second step is online group buying. After registering, users will become members of the online shopping service platform and can browse group-buying information and participate in group-buying activities. The third step is to charge commissions for online buying services. According to the actual consumption of group purchase users in the company.
- B. Advertising revenue. As the catering and other life service industries become increasingly competitive, companies are also paying more attention to the power of advertising. However, due to geographical location, enterprise scale, and other factors, it is often difficult to find an effective advertising platform or carrier,

and an online shopping service platform provides enterprises with a fast and effective way of word-of-mouth advertising. The feedback is a low-cost, high-impact advertising vehicle for companies that want to create a good brand reputation among consumers. In addition, considering the personalized consumption needs of different users and different regional characteristics, the online shopping service platform will launch targeted advertisements in different cities according to the user preferences of different regions, and the advertising will also target users in different network segments.

- C. Information revenue. The value-added wireless services provided by online shopping service platforms generate information revenue for them. There are two main aspects:
1. As a content provider, cooperate with many channel service providers, such as China Mobile, China Unicom, China Telecom, Air Network, handheld devices, etc. Launch information services based on SMS, WAP, and other wireless technology platforms. Seamless interaction of data and information provides real-time and accurate group purchase information for home mobile users;
 2. Achieve cooperation in the filed of GPS to accurately identify consumption destinations for users of automotive navigation systems. As for the total income, the online shopping service platform and its partners divide it into a certain proportion to form information income.

8.2.3 Cross-Border E-Commerce Platform

The rapid development of cross-border e-commerce is inseparable from the strong guarantee of cross-border e-commerce platform, which is an important medium of cross-border e-commerce transaction activities. In recent years, both the number and transaction scale of China's cross-border e-commerce platforms have shown a trend of blowout growth. According to the different business models of cross-border e-commerce platforms, cross-border e-commerce platforms can be divided into two categories: platform-based cross-border e-commerce platforms and self-operated cross-border e-commerce platforms.

8.2.3.1 Platform Type Cross-Border E-Commerce Platform

Platform-based cross-border e-commerce means that e-commerce enterprises provide trading platforms on which merchants or individuals set up shop and sell goods. The main characteristics of platform cross-border e-commerce are as follows: first, transaction subjects provide cross-border e-commerce platforms for commodity transactions, and do not participate in relevant transaction links such as commodity purchase and sales; second, foreign brands, manufacturers, distributors, and online

shop owners enter the cross-border e-commerce platform to display and sell goods; third, there are many merchants and a variety of goods.

The advantages and disadvantages of platform cross-border e-commerce are quite distinct. Its advantage performance, one is the commodity supply is extensive and sufficient; second, a wide variety of goods; third, convenient payment method; fourth, the platform scale is larger, and the website traffic is larger. The disadvantages are shown as follows. First, cross-border logistics, customs, commodity inspection, and other links lack their own stable channels, and the service quality is not high; second, the quality assurance level of goods is low, prone to various types of commodity quality problems, resulting in low consumer trust.

(1) Operation mode

The type of cross-border e-commerce management platform is relatively light, focusing on pre-sale drainage, investment attraction, and platform management.

The process connection of platform mode is “drainage – investment – platform – logistics – service”. First of all, traffic is the basis of e-commerce based on cross-border platforms, so the national e-commerce giants will carry out a large number of market activities through cross-border channels to build brand awareness and image. In the process of investment promotion, the platform shall strictly control the company’s qualifications and indirectly control the commodities. The reseller or seller must be based abroad and perform procedures such as verifying merchant qualifications and verifying buyer information. In terms of logistics connection, platform-based cross-border e-commerce mainly adopts direct mail, and the platform builds a logistics system to serve sellers. Usually establish their own logistics information system to connect logistics information; self-built logistics, which can collect goods from abroad and then return to China; self-built bond warehouse to provide services for enterprises. In terms of service, cross-border e-commerce platforms will supervise the sellers’ service quality, complete after-sales services, and undertake partial return and exchange services in case of a lack of sellers.

(2) Profit model

Platform-based cross-border e-commerce generates revenue through commissions and advertising. The platform takes a percentage of sales as a commission and uses traffic to the platform in the form of selling advertising. Moreover, platforms are easy to scale: when the volume of transactions on the platform reaches a certain size, a lot of revenue can be generated by charging sellers commissions. When the volume of traffic and users on the platform reaches a certain level, it can also be highly profitable through advertising.

8.2.3.2 Self-operated Cross-Border E-Commerce Platform

Self-operated cross-border e-commerce means that e-commerce enterprises themselves are responsible for the purchase and transportation of goods for retailers and

sell them on their own platforms. The main characteristics of self-operated cross-border e-commerce are as follows: first, it develops and operates cross-border e-commerce platforms, and purchases goods from overseas and prepares goods as the main purchasers of goods; second, it involves the whole supply chain from commodity supply, sale to after-sale.

The main advantages of self-operated cross-border e-commerce are as follows: firstly, the e-commerce platforms and commodities are self-operated, with strong control ability; second, the product quality assurance level is high, business reputation is good, consumer trust is high; third, the supply of goods is relatively stable; fourth, the resources of cross-border logistics, customs, and commodity inspection are stable; fifth, convenient cross-border payment. The main disadvantages of self-operated cross-border e-commerce are: first, high overall operating costs; second, the demand for resources; third, high operational risk; fourth, financial pressure; fifth, the problem of unsalable goods, return and exchange of goods is obvious.

(1) Mode of operation

The self-managed cross-border e-commerce is closer to the traditional marketing model than the cross-border e-commerce on the platform. It pays more attention to the development and research of commodities and commits itself to the whole supply chain of commodities. It must fully participate in the whole process of operation, including pre-sale selection, supplier negotiation, and operation, as well as in-depth management of logistics and services.

The process connection of platform mode is “supplier – selection – operation – logistics – service”. Suppliers include brands, distributors, and agents, but foreign trademark authorization rules are different, so it is difficult to directly obtain the authorization for foreign trademarks. In the selection of products, we must be accurate and forward-looking to avoid excess inventory. On the one hand, we will choose popular products to ensure safety, and on the other hand, we will dig into undeveloped high-quality raw materials. In terms of operation, the self-operated cross-border e-commerce platform undertakes commodity operation functions and promotes operation and sales through community, brand marketing, price subsidies, big data recommendation and live broadcasting. In logistics, they are mostly interconnected: the platform should act as a cross-border logistics organiser, working with logistics providers to establish or lease deposits. In terms of service, the platform has its own customer service and after-sales teams, most of which provide return and exchange services, as well as unified and standardized management of pre-sales and after-sales services.

(2) Profit model

Independent cross-border e-commerce generates profits by capturing price differences of raw materials. The price difference comes from strict cost control in the buying and selling process. For example, scaling up raw material sales can reduce logistics, storage and marketing costs for a single item and generate profit margins. However, independent cross-border e-commerce has invested a lot of money in the early stage of development: capital is needed for the construction of the upstream

supply chain, the timeliness of logistics and customs clearance, the establishment of auto warehouses in customs areas, and the price war to subsidize users to increase the buyback rate. A heavy investment makes it difficult to make early profits. The industry must go through a period of development, form a certain scale, strictly control the cost of each link, gradually reduce the cost, and gain profit space.

8.3 E-Commerce Platform with Field as the Core

8.3.1 VR Electrical Contractor

8.3.1.1 VR Technology

Virtual reality is virtual reality, as the name implies, it is a combination of virtual reality and reality. VR is used in many fields, such as film and television, games, design, medicine, military, aerospace, etc., and the application fields are constantly expanding.

8.3.1.2 Application of VR Technology in E-Commerce Field

(1) Application of VR technology in e-commerce

Classic e-commerce has reached a time of slowing down, and the reality behind it is that the penetration rate of home Internet users is gradually saturated, and the dividend of Internet traffic is exhausted. The e-commerce market has shifted from growth to equities. Stimulating growth by increasing user size has become ineffective. The transport market has become an almost zero-sum dilemma. Every time a rival adds a client, it must lose one. For the e-commerce industry, digging deeply into the value of a single user, increasing customer unit price, or increasing user consumption frequency will become another growth point, and this energy is experiential consumption.

The solution of experiential consumption in e-commerce actually includes integrating virtual reality technology, reconstructing the consumption concept of traditional e-commerce through virtual reality, gradually satisfying the growing middle-class economy, and vertically digging the deep user value. “VR + e-commerce” is when you wear VR head display, using VR technology, computer generated a simulation environment, a multi-source information fusion, interactive THREE-DIMENSIONAL dynamic vision, and physical behavior of the system simulation to immerse you in the environment. Before the emergence of VR e-commerce, the interaction between online shopping users and commodities has been stuck in the two-dimensional information stage of “text + image + video”. The impact of virtual reality shopping is undoubtedly another exciting revolutionary technological product for e-commerce.

VR e-commerce allows consumers to fully understand commodities in the virtual space, making it more convenient to buy commodities and opening up the consumer market. Virtual reality shopping has environmental scenes, and customers can also see thousands of products in the virtual reality shopping center, which is established by three-dimensional modeling technology. Image-based 3D reconstruction: using the structural information of photographs, the 3d structure of the subject can be recovered by taking multiple pictures from different angles, and internal and external positioning can be carried out according to the spatial position and orientation obtained at the time of shooting.

Large domestic e-commerce platforms have opened VR shopping entrance, marking the first step towards VR e-commerce. Domestic large e-commerce platforms are realizing commodity panorama, enabling platform customers to experience the feeling of shopping online, such as online makeup, online car, online house, etc. At present, this mode is most widely used in automobiles. A certain automobile vertical e-commerce platform has a panoramic car viewing function. And VR electricity also can solve some special categories of goods offline sell the inconvenient problem, such as cigars online the VR shopping mall and cigar products and its supporting products because the price is relatively high, the number of dealers in the entity shop display commodity is limited, each branch can't fully display goods category, and brand headquarters of cigar are almost abroad. When new products are launched, they cannot be displayed in domestic stores in time, so VR mall can solve this problem. Through the VR mall system, guests can simultaneously watch the most new virtual images of foreign countries at the first time and can grasp the products through the handle to browse the products carefully, and place an order immediately after they like the products. Enjoy new products in time regardless of region or time limit, so that consumers can have a better shopping experience, and the system can retain the purchasing habits of users to provide precise marketing services.

(2) Limitations

Experience consumption based on virtual reality still has its inherent limitations and technical difficulties, that is, the limitations of virtual reality sensory experience and the interference of content production.

Experiential consumption can be divided into five basic experiences: sight, touch, hearing, smell, and taste. Virtual reality has nothing to do with visual experience, only visual technology can improve the visual experience. This is the limitation of virtual reality for experience consumption. The lack of VR sensory experience will limit the scope of its use in e-commerce experience consumption: for example, for Fresh e-commerce, even if VR technology is used to create realistic effects, it is only in the state of the product at the time, and Fresh's high timeliness means it has few benchmarks to choose from. For example, for liquor e-commerce and beauty e-commerce, the weakness of their experience consumption is not based on vision, but must taste liquor and red wine at the same time; the beauty product experience is a horizontal experience based on smell and touch. Therefore, experiential consumption of virtual reality technology focuses on enhancing visual experiences, such as

furniture, household appliances, and clothing products. Virtual reality technology is not suitable for all electronic products.

On the other hand, VR content creation has its limitations. Virtual reality has been a content-based technology since its inception. Among the public, many VR content consumption devices have become popular. So far, consumers have found that, in addition to mixing, the market is full of games and videos that are not consumer goods and are meant to be experienced, not entertained. Reflected in the field of e-commerce, they are characterized by complex categories and large numbers. Every major e-commerce platform covers millions of raw materials. Of course, in virtual reality, many of the raw materials can't be made overnight. Although the VR platform is established to provide a universal and standardized development tool for rapid mass production of 3D models, it is difficult for a universal tool to accurately and carefully restore the detailed features of a single product, which will greatly reduce its positive role in promoting consumption, which runs counter to the purpose of experiential services.

In terms of hardware, the low delay rate and upgrade rate of virtual reality experience equipment leads to the physical discomfort of subjects. Such issues will be resolved through hardware performance updates.

8.3.1.3 Future Development of VR E-Commerce Platform

Virtual reality e-commerce is a very interesting development direction of classic e-commerce, which explores a new consumption mode. As an Internet model to promote the development of the real economy, "Internet plus" often involves non-standard service industries such as catering, entertainment, and life services, which cannot fully realize e-commerce. These non-standard services require consumers to spend in person, so they can't get away from offline physical transactions. Virtual reality e-commerce extends upward on the basis of pure Internet e-commerce, which is still a continuation of the classic e-commerce model. Solve the experience problems of standard products and services and improve the standard service value of goods. The combination of virtual reality e-commerce driven online experience consumption and "Internet+" driven online experience consumption will become a complete e-commerce solution to replace the traditional physical commerce, which is the overall evolution of e-commerce industry to experience consumption. At present, virtual reality e-commerce can only achieve part of the mode of experiential consumption scenes, in touch, smell, taste experience realization, VR e-commerce needs further research, all aspects need time and capital support, and there are many bumpy development roads to go.

8.3.2 *Meta-Cosmic E-Commerce*

8.3.2.1 Meta Cosmic Technology

Metaverse is a virtual world connected and created by technological means. It maps and interacts with the real world, and is a digital living space with a new social system. Metauniver is essentially a real-world virtualization and digitization process that requires massive transformations of the world's content production, economic systems, user experience, and physical content. However, the development of the metauniverse is gradual, ultimately through the continuous integration and evolution of many tools and platforms supported by shared infrastructure, standards, and protocols. It provides an immersive experience based on extended reality technology, generates a mirror image of the real world based on digital twin technology, builds an economy based on blockchain technology, tightly integrates virtual and real worlds in economic, social, and identity systems, and allows each user to produce content and change the world.

The future of the metaverse is bright: on the platform, you can watch movie premieres and attend any convention; enjoy a wide variety of exhibitions with cheaper digital tickets; people's interaction is not limited to text, voice, and video, virtual personality can interact with game entertainment in real time. Online shopping is no longer a two-dimensional introduction interface to search for goods, live bring goods, or look at goods. In the future, shopping can be done with VR glasses, and the browsing experience of goods can be more diversified.

8.3.2.2 Application and Future Trend of Meta-Universe in E-Commerce Field

(1) Virtual human brand live operation

More and more virtual anchors and idols have appeared on major live broadcasting platforms. Compared with real people, virtual people can serve, entertain and socialize at the same time. In terms of social interaction, virtual people can interact with users at a high frequency through round-the-clock live broadcast, thus strengthening the emotional connection. In terms of entertainment, virtual people have more multiple ways of playing and can attract more traffic for brands and live broadcast. At present, some virtual beauty bloggers release videos and photos on social platforms, attracting millions of fans and causing users on various platforms to imitate their makeup. In terms of service, virtual human can realize the addition of functions through AI and other technical advantages, reduce the waste of manpower in repetitive work, so as to improve quality and efficiency. Meanwhile, virtual human assets can be accumulated, and the image and content can be repeatedly used and extended, providing an important fulcrum for the long-term operation of the brand. To sum up, the virtual human brand live broadcasting operation can be applied to

live broadcasting e-commerce. Virtual human live broadcasting is already available, and the application trend will be more significant in the future.

(2) Virtual assets

“Goods” is one of the main driving forces for the growth of e-commerce industry. Classic e-commerce generally attracts consumers through the quality, complete variety, lower price, and logistics advantages of goods. In the meta-universe, the “goods” of e-commerce platform are not only physical goods, but virtual goods, such as digital collection. With the rise of the concept of NFT, like the recognition of digital assets on the blockchain, NFT is unique and cannot be tampered with and copied, in line with the needs of consumers for unique characteristics of collectibles, thus being given the attributes of digital collections. In 2021, a large domestic e-commerce platform launched the digital collection channel, which showed the digital redesign of physical goods through virtual people. During the event, more than 20,000 people participated in the lottery for the limited number of alien digital collections. More than 30,000 users of a daily chemical brand’s limited digital collection lottery; all 1,111 limited digital collections issued on a platform were sold out within two seconds.

(3) Immersive shopping

Compared with e-commerce, the advantages of offline shopping mainly focus on visual experience. Consumers can feel goods through vision, touch, and trial. Video and live streaming e-commerce develops rapidly based on consumers’ desire for the more online shopping experience. In the future, online shopping can overcome some physical obstacles in the world through AR/VR/MR and other new technologies, and achieve multi-sensory interactive shopping experience such as audio-visual and even tactile, while consumer shopping scenes can be virtual malls, digital pavilions, and so on. VR e-commerce introduced above is actually the entry of the meta-universe e-commerce.

In the world of the meta-universe, each e-commerce platform can directly enter the meta-universe and establish its own trading platform or virtual mall in the virtual world. Even this e-commerce platform is for the users of the meta-universe all over the world, opening a huge trading space in another new world. Consumers can directly consume and shop inside each virtual mall or e-commerce platform in the meta-universe. The company can establish its own 3D commercial space, and customers can experience the brand new shopping experience of cloud shopping after entering the store. Consumers can also use their virtual images to try on clothes and lipsticks in the meta-universe, and in the real world, they can try on clothes and colors without going out of the house.

In the meta-universe, the e-commerce industry will also show the trend of gamification, and create a new shopping and life style with immersive experience. People can shop in a gamified and entertaining way, or simulate a game or entertainment experience in the way of shopping. In addition, the meta-universe does not have to have an independent economic system. People can continue to use wechat Pay,

Alipay, digital RMB, or virtual assets in the meta-universe. The meta-universe is highly linked to reality.

The door connecting the virtual world and the real world has been opened. Cloud computing, 3D modeling, and all kinds of convergence of technologies will affect the future of a more unique retail experience. Every new field development is a process of discovering the “incremental market” from the “stock market”. The meta-universe means a larger market scale. As the result and beneficiary of the development of Internet technology, the prevalence and development of the concept of meta-universe will also bring more power to the development of e-commerce, and even reshape the business model of e-commerce.

8.4 Summary of this Chapter

This chapter classifies the e-commerce platform according to the three cores of “people”, “goods” and “field”. Firstly, the human-centered e-commerce platform is introduced. Starting from the new forms and modes of e-commerce, the development status, operation mode, and classification of social e-commerce are introduced, and the typical mode of social e-commerce—livestream e-commerce is introduced in detail. Then, it introduces the e-commerce platform with goods as the core. From the types of goods on the e-commerce platform, it is divided into tangible goods and intangible goods, corresponding to the classic e-commerce platform—online shopping platform, online and offline integration of classic e-commerce platform—online shopping service platform. The concept introduction and business model analysis of these two platforms are made. Finally, it introduces the e-commerce platforms with the field as the core, namely VR e-commerce and meta-universe e-commerce, and introduces their technologies, applications, and future development.

With the development of the times and technology, e-commerce platforms will certainly develop as well. With the advancement of globalization, digitalization and informatization, e-commerce platforms and channels will continue to evolve around the three cores of “people”, “goods” and “field” to better serve e-commerce and better link all parties in e-commerce.

8.5 Questions for Review

1. What is social e-commerce?
2. What are the three core features of social e-commerce?
3. What are the advantages of social e-commerce compared with classic e-commerce?
4. What are the categories of social e-commerce?
5. Briefly describe the operation mode of social e-commerce of purchase.

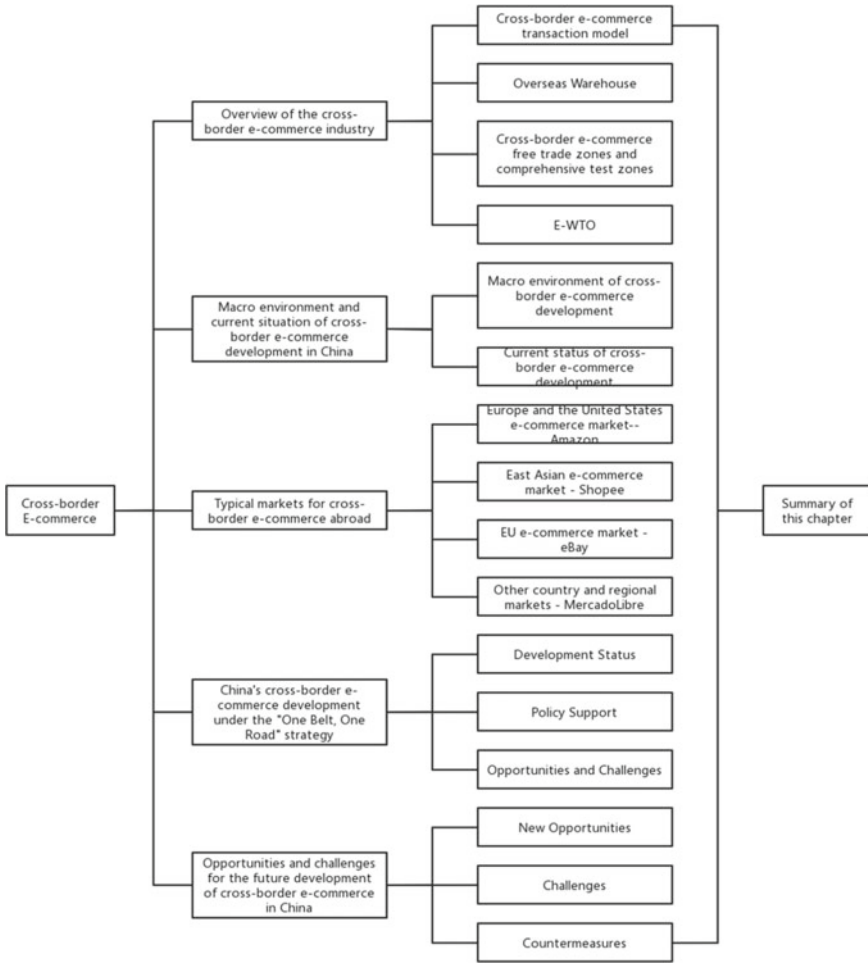
6. What is livestreaming e-commerce? What are its characteristics? What are the advantages?
7. Briefly describe the operation mode of livestream e-commerce.
8. Try to analyze the influence of live streaming e-commerce on the supply and demand sides from the perspective of industrial chain.
9. What are the core competitive elements of livestreaming e-commerce?
10. Please briefly describe the differences and similarities between tangible and intangible products and give examples.
11. Analyze the business model of classic e-commerce—online shopping platform.
12. Analyze the profit model of online and offline integration of classic e-commerce—online shopping service platform.
13. Brief the operation mode of platform-based cross-border e-commerce platform.
14. Briefly describe the operation mode of self-operated cross-border e-commerce platform.
15. Brief the application of VR technology in the field of e-commerce.
16. What are the limitations of VR technology in e-commerce?
17. Briefly describe the application and future trend of metauniverse in the field of e-commerce.

Chapter 9

Cross-Border E-Commerce



Knowledge Map of this Chapter



Just after 00:00 on January 1, 2022, in the Regional Comprehensive Economic Partnership Agreement (RCEP) Qingdao Economic and Trade Cooperation Advance Innovation Pilot Base, Qingdao Customs issued the RCEP Certificate of Origin for more than 2800 tons of calcium chloride exported to Japan by Qingdao Bay Group Co.

On January 1, the Regional Comprehensive Economic Partnership Agreement (RCEP) entered into force for six ASEAN members, including Brunei, Cambodia, Laos, Singapore, Thailand and Vietnam, as well as 10 countries, including China, Japan, New Zealand and Australia. South Korea has also completed the approval process and will enter into force on February 1, while

other members are stepping up the approval process. The world's largest free trade area has officially set sail.

RCEP is a highly systematic and comprehensive policy system, which encompasses all-round and multi-disciplinary liberalization arrangements for trade in goods, trade in services, two-way investment, intellectual property rights, trade remedies, competition, etc. It will bring significant development opportunities to enterprises. Taking agriculture as an example, the RCEP region is an important destination for China's agriculture to go out, and the negative list management has significantly relaxed market access restrictions, which will be beneficial for China's agricultural enterprises to carry out mutually beneficial cooperation in regional agricultural planting and processing.

Experts suggest that local conditions should be adapted to local conditions, including the RCEP, the FTA strategy fully integrated into regional and local development strategies. For example, the Northeast and Bohai Rim regions can use their geographical advantages to build a bridgehead for the Northeast Asian economic circle and opening to Japan and South Korea. For example, Guangdong, relying on the Guangdong-Hong Kong-Macao Greater Bay Area, is the connecting hub between China and Southeast Asia, and can combine the development of manufacturing with design, logistics, finance and other service industries to become a world supply chain center for East Asia.

Reflections:

1. What impact has RCEP had on China's foreign trade?
2. How should Chinese enterprises seize the opportunities brought by RCEP to improve their competitiveness?

9.1 Overview of the Cross-Border E-Commerce Industry

Cross-border e-commerce refers to an international business activity in which transaction subjects belonging to different custom borders reach transactions, make electronic payment settlement through e-commerce platforms, and deliver goods through cross-border e-commerce logistics and off-site storage, so as to complete the transactions (Table 9.1).

China's cross-border e-commerce has gone through the following four stages:

Cross-border e-commerce 1.0 era: The main business model of cross-border e-commerce before 2003 was the foreign trade information service model of online display and offline transaction, which did not involve any transaction link on the network.

Cross-border e-commerce 2.0 stage: In 2004-2012, cross-border e-commerce platforms began to get rid of the display behavior of pure information yellow pages, electronicize offline transactions, payments, logistics and other processes, and gradually

Table 9.1 Cross-border e-commerce overview table

Content	Cross-border e-commerce	Traditional Foreign trade	Domestic e-commerce
Development origin	The sprouting of the late twentieth century began, originating in 2005 with the personal shopper	Originating in the fourth or fifth century BC, it began on the Maritime Silk Road during the Qin Dynasty The rise of the land-based Silk Road in the Han Dynasty	Started in the 1990s Electronic data interchange
Trading subjects	Trade parties are divided into different countries or customs borders	Trade parties are divided into different countries or customs borders	The same territory for both sides of the trade
Business model	B2B (business-to-business), B2C, C2C (consumer-to-consumer), etc.	Contract-based business model	B2B, B2C, C2C, etc.
Product category	Rich and diverse product categories, timely updates	Fewer product categories, delayed updates	Rich and diverse product categories, timely updates
Logistics requirements	More with the help of third-party logistics Higher consumer demand for logistics services	Mostly air freight or containerized sea freight, logistics factors on the main body of the transaction Not much impact restricted by trade policies	Logistics mode can be self-operated or third-party logistics Higher demand for logistics services
Coverage	With global coverage Large market size Not subject to trade policy restrictions	Trading scope is only for countries with trade agreements, large market size but limited by geography	Nationwide coverage, larger market
Price and profit	Affordable price Lower costs and higher profits	Higher prices High cost and low profit	Affordable price Low cost and high profit
Trading session	Simple, few middlemen	Complicated, with many intermediaries	Simple, few middlemen

realize online trading platforms. In 2010, Selling Through was officially launched and the progress of the industry accelerated.

Cross-border e-commerce stage 3.0: The year 2013 was an important transition year for cross-border e-commerce, and the business model of the entire cross-border e-commerce chain has undergone radical changes. Cross-border e-commerce showed

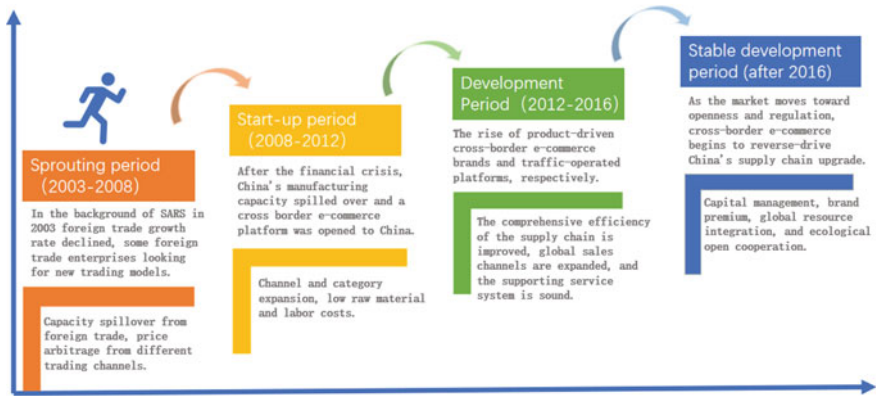


Fig. 9.1 Cross-border e-commerce development process chart

the characteristics of large factories coming online, B-class sellers becoming large-scale, the proportion of medium and large orders increasing, large service providers joining and mobile user volume exploding.

Cross-border e-commerce stage 4.0: In 2016, China's export scale has successfully surpassed the United States, becoming the world's largest e-commerce export country. Chinese sellers are opening stores far faster than customers from other countries, and with the support of the national Belt and Road policy, cross-border e-commerce is in a phase of industry explosion (Fig. 9.1).

9.1.1 Cross-Border E-Commerce Classification

9.1.1.1 Cross-Border E-Commerce Transaction Model

- (1) C2C is Customer (consumer) to Customer (consumer), where the transaction takes place between a consumer and a consumer, where one consumer sells goods to another consumer through an online platform.
- (2) B2C, or Business to Customer, is a transaction that occurs between a merchant and a consumer, and this model can significantly improve the efficiency of the transaction between the two parties.
- (3) B2B, or Business to Business, is a transaction that takes place between companies and companies or between businesses and businesses, which includes not only the exchange of products, but also the exchange of services and information. The B2B trading model provides a large shopping platform where buyers can find all the sellers and all the information about their products and also can post their purchasing needs according to their specific needs.

The most essential difference between B2B and B2C is that the customer groups targeted are different, and they can be simply understood as wholesale (B2B) and retail (B2C). B2B market is composed of the purchase, production and sale of products and services, while the cross-border B2C market is a process of providing products and services to individual consumers. So B2B and B2C are also different at this point. Consumer buying behavior under B2B will be influenced by the behavior of other consumers, but consumers under B2C can decide for themselves whether they want to buy the good or service. Therefore, there will be more factors influencing whether consumers will choose to buy under the B2B model, and the purchasing behavior will be more complex.

B2B is more advanced than B2C, because B2B has many links, the whole process down the cost will be very high, and many links will lead to information asymmetry and other situations, B2C is able to omit a lot of tedious links, things can be sent directly from the factory to the hands of consumers. For manufacturers, although B2B can bring more orders to manufacturers, B2C can help manufacturers better grasp the market information, grasp the consumer preferences.

9.1.1.2 Cross-Border E-Commerce Import Clearance Mode Classification

At present, the cross-border e-commerce import business clearance mode mainly includes four kinds of customs clearance modes: CC (proxy mode), BC (sea amoy mode), BC (direct mail 9610 mode), BBC (bonded 1210 mode) (Table 9.2).

With the continuous adjustment of the national e-commerce policy, the current CC (proxy) and local direct mail logistics (sea amoy) model gradually withdrew from the e-commerce stage, the state more encouraged and supported the legal compliance of BC direct mail (9610) and BBC bonded warehouse (1210) cross-border e-commerce model (Fig. 9.2).

In the BBC (bonded warehouse) model, the cross-border e-commerce website will first send the goods to the local bonded logistics center, to be declared and inspected by customs on the goods, and only after passing the goods can be sold to consumers. After the consumer places an order, the e-commerce platform will generate various documents related to this order, which will be submitted to the customs system for declaration, and only after the declaration is successful can the goods be packaged and sent out. Sell one, customs clearance one, not sold out of the bonded center, but also no need to declare, not sold can also be returned directly to foreign countries. However, it does not allow the immediate purchase (except for some pilot areas) and buyers to resell again.

The BBC (bonded warehouse) model is closely monitored during the entire customs clearance process, and the information of each process is transparent, so the quality of goods and the interests of consumers can be well protected. Its main advantages are:

Table 9.2 Comparison of customs clearance modes

Mode	Buy on behalf of	Amoy	Cross-border e-commerce	
Introduction	Buying overseas goods directly through foreigners or buyers and sending them back to China	Purchased directly from overseas e-commerce sites and sent back to China by the e-commerce sites	Buy on domestic B2C e-commerce sites	
Trading method	B2B	B2C	B2C	
Product categories	No restrictions	No restrictions	The list of goods imported by cross-border e-commerce retail	The list of goods imported by cross-border e-commerce retail
Logistics method	Overseas direct mail/human brought back	Overseas direct mail	Direct mail mode (9610)	Bonded model (1210)
Logistics time	Slow	Slow	Slow	Quick
Passing speed	Slow	Slow	Take the customs clearance EDI declaration system, fast	
Customs clearance	No customs declaration, spot check	No customs declaration, spot check	Customs declaration required (three single docking)	
Taxes	Sampling to payment of travel tax	Sampling to payment of travel tax	Cross-border e-commerce integrated tax	
Trust model	Trust in the individuals who buy on behalf of others	For overseas e-commerce trust in the platform	Trust in domestic e-commerce platforms	

1. Bonded warehouses are responsible for the temporary storage of goods, with low costs to consumers and easy returns and exchanges.
2. The product entry has legal inspection procedures and quality assurance.
3. Bonded stocking mode can significantly reduce the procurement and logistics costs of goods.
4. There is a national policy guarantee, rapid development and scale.



Fig. 9.2 Bonded warehouse model diagram

9.1.2 Overseas Warehouse

9.1.2.1 Prospects and Significance of Overseas Warehouse Market

Overseas warehouse can reduce the logistics cost of cross-border e-commerce, and also can shorten the logistics transportation time of goods. The overseas warehouse is actually to turn an act between the international into a localized trade act, and can increase the market competitiveness of cross-border e-commerce enterprises because of the reduction of cost.

Cross-border e-commerce enterprises can choose to repair themselves or rent a warehouse to be an overseas warehouse, and then send the goods they sell to the overseas warehouse for storage in advance, and realize transnational distribution logistics through this way. Overseas warehouse is essentially a logistics system with overseas warehouse as the core, which includes bulk cargo transportation, domestic and overseas trade customs clearance, refined warehouse management, personalized order management, packaging and distribution as well as comprehensive information management. The overseas warehouse can enable Chinese enterprises to form a new situation in the world's major consumer markets with online as the core and radiation to offline, enhancing the ability of Chinese brands to master the international market channels and making it an excellent channel for Chinese cross-border e-commerce to enter the international retail market. At present, overseas warehouses have become a new type of foreign trade infrastructure, supporting the development of cross-border e-commerce in each country and helping each country to develop international markets. The purpose of reducing the number of overseas warehouses is to further shorten the distance between the sellers and buyers, and to successfully

transform transoceanic cross-border into local services. Compared with other cross-border logistics forms, overseas warehouses have natural support for after-sales return services, and in this context, cross-border e-commerce logistics overseas warehouses are gradually becoming popular—sellers can prepare products in advance to exist near the consumer's delivery address, and after the order is placed, the system screens out the nearest warehouse to the consumer to deliver the goods.

China has always been a big exporter, because in China there is no brand + global direct sales or distribution business model, so in the early days China did not need overseas warehouses very much, until Huawei, Haier and other enterprises also began to develop internationally, China began to need overseas warehouses. International enterprises can turn the traditional international delivery into local delivery with the help of building overseas warehouses, so that goods can be delivered to consumers faster and consumers have a better sense of cross-border shopping experience than before. We believe that the service and performance of overseas warehouse will have more room for development in the future.

Cross-border e-commerce enterprises have always faced problems in the process of operation like the logistics problems, such as poor customs clearance, the number of operations leading to damage to goods, etc., Since these problems are directly linked to the experience of consumers, when the traditional direct mail model has no way to solve such logistics problems, overseas warehouses can, so overseas warehouses have emerged on a large scale. So far, the number of overseas warehouses in the United States is the fastest growing; the number of overseas warehouses in Britain, Japan and Germany has approximately doubled compared to 2019, and the total area of overseas warehouses in Australia in 2019 has grown 6 times the number of overseas warehouses in 2018, and the growth rate is very fast, so in fact, there is still a great scope for overseas warehouses.

9.1.2.2 Overseas Warehouse Operation Mode

(1) Business process of self-operated overseas warehouse

- Step 1 The export cross-border e-commerce business will ship the goods to, or entrust the logistics carrier to send the goods to the enterprise operating of overseas warehouse. This international freight can take the sea, air or express way to reach the warehouse.
- Step 2 Export cross-border e-commerce companies use their own logistics information systems to remotely operate goods in overseas warehouses and keep them updated in real time.
- Step 3 Export cross-border e-commerce logistics department according to the instructions of export cross-border e-commerce to store, sort, pack and distribute the goods and other operations.
- Step 4 The system information is updated in real time. After the shipment is completed, the logistics system of export cross-border e-commerce

will be updated in time to show the inventory status, allowing export cross-border e-commerce companies to grasp in real time.

(2) Business process of public overseas warehouse

Exporting cross-border e-commerce companies transport goods centrally to overseas warehouses operated by third-party logistics enterprises for storage by sea, air or express, and give operation instructions through the inventory management system of third-party logistics enterprises.

- Step 1 The export cross-border e-commerce business will ship the goods to, or entrust the logistics carrier to send the goods to an overseas warehouse operated by a third-party logistics company. This section of international freight can be taken by sea, air or express delivery to the warehouse.
- Step 2 Export cross-border e-commerce companies use the logistics information system of third-party logistics companies to remotely operate the goods in overseas warehouses and keep them updated in real time.
- Step 3 Third-party logistics enterprises according to the instructions of export cross-border e-commerce storage, sorting, packaging and distribution of goods.
- Step 4 After the shipment is completed, the logistics system of the third-party logistics enterprise will be updated in time to show the inventory status, and export cross-border e-commerce companies can grasp it in real time.

9.1.2.3 Analysis of Advantages and Disadvantages of Overseas Warehouse

(a) Advantages of overseas warehouse

(1) Improve the efficiency of distribution services

Cross-border e-commerce platforms will open overseas warehouses in the destination countries of sales in order to deliver products to buyers faster. Compared with international express and small parcels, overseas warehouses can reduce the cumbersome links of end delivery, and do not require cross-border transportation and customs clearance and declaration (but the distance from domestic transportation to overseas warehouses still requires these links), and directly deliver express parcels to overseas warehouses in destination countries, and express delivery to buyers through overseas warehouses, which can reduce the time spent on complicated operation links.

(2) Enhance the sense of customer shopping experience

The existence of overseas warehouses provides a lot of convenience for the return and exchange of goods, which is inevitable when shopping. Overseas warehouse can provide customers with product testing, replacement packaging and other services, so as to achieve secondary sales of products and reduce operating costs. For example, Newcool International U.S. overseas warehouse one delivery reference time: U.S. West 1–2 days, U.S. Central 2, 3 days, U.S. East 2–4 days.

(3) Reduce logistics operating costs

For medium and large sellers, it is very common to have a large volume of concentrated shipments. It is very necessary to prepare goods in advance when the off-season comes. Sea freight is the cheapest among FBA headway logistics, much cheaper than air freight and international express, and, with the increase of quantity, the logistics cost will also be reduced. To deliver large quantities of goods to Amazon's warehouse at one time is unrealistic, therefore, overseas warehouse storage or overseas warehouse one piece shipping service is a good choice.

(4) Improve buyer trust and store repurchase rate

When buyers shop on the Internet, they generally give preference to stores with local shipping points that are relatively close. This will result in a better shopping experience and a much higher repurchase rate, thus improving the seller's store's positive reviews and competitive advantage.

(b) Disadvantages of overseas warehouse

(1) Small and various products are not suitable for overseas warehouse

The third-party overseas warehouse is not very friendly to the products of small goods and pavement-type sellers. For example, small trinkets, keychains, cell phone covers and other SKU, style and small volume of goods, want to complete such orders, and it requires a lot of manpower and time. It is very difficult for overseas warehouse to do one-off delivery for such products. Overseas warehouse is suitable for products with single quantity of category, large volume and heavy weight.

(2) Storage costs

Staggering early delivery and stocking up in overseas warehouses will incur certain logistics and storage costs. The storage fee of overseas warehouse in the United States is calculated by day. Need to consider the cost of storage expenses.

(3) Increased inventory and capital pressure

If the products are slow selling and far away from the overseas warehouse, either abandoning the goods or returning them to the country is a big headache, and hoarding is undoubtedly to accumulate a lot of money, once the products do not sell or sell very slowly, then there will be the possibility of losing money. Therefore, overseas warehouse is suitable for products with fast turnover and quick return of capital.

(4) Small overseas warehouses are mixed and confusing in price

You need to choose regular and powerful overseas warehouse company for cooperation in order to ensure the safety of goods. Overseas warehouses are generally located abroad, such as the United States, Europe, Japan, etc. If there is a problem, it will be more trouble. If greedy for very low prices choose irregular overseas warehouse that may cause significant losses.

9.1.3 Cross-Border E-Commerce Free Trade Zones and Comprehensive Test Zones

9.1.3.1 Cross-Border E-Commerce in the FTA

From the establishment of special economic zones, the introduction of foreign investment, to the accession to the World Trade Organization, China's road to opening up to the outside world is getting wider and wider. Free Trade Zones (FTZs) are a new highlight of China's expanding opening up in recent years. The report of the 19th National Congress of the Communist Party of China (CPC) proposed "to promote the formation of a new pattern of comprehensive opening up" includes a special discussion on free trade zones, "to give greater reform autonomy to the pilot free trade zones and explore the construction of free trade ports." This is not only a full affirmation of the development of these years of free trade zones, but also a new point of view of China's reform and opening up.

In 2013, the State Council approved the establishment of China (Shanghai) Pilot Free Trade Zone, which is China's first pilot free trade zone, and the listing of Shanghai's first "cross-border e-commerce demonstration park", followed by Guangdong, Fujian, Liaoning and other 10 free trade zones, so far, China formed "1 + 3 + 7", a total of 11 FTZs, the development of cross-border e-commerce in China's FTZs is thus opened. Since each FTZ is located in a different geographical location and has a different resource environment, the characteristics it presents are also different. As a pilot zone of China's new round of reform and opening up, the FTZ is the highland of system and policy innovation, and also provides replicable and extendable experience for the whole country as its "mission".

Question	Causes of the problem	Solution
Talent development issues	There is a lack of compound talents engaged in cross-border e-commerce in the FTZ, and it is difficult for the advantages of cross-border e-commerce in the FTZ to be effectively played	Build multi-level and three-dimensional and a full range of talent development systems
Trading credit issues	Due to the virtual nature of the network, information asymmetry, international economic and trade economic and trade cultural habits and other factors, to a certain extent the identity of the other party can not be effectively identified in a timely manner, resulting in the risk of credit deficiency on both sides of the transaction, thus affecting the normal conduct of foreign transactions	The construction of a global cross-border e-commerce credit system can be put on the agenda, and a credit evaluation index system and credit evaluation model can be established by relying on big data, thus promoting a more reliable and healthy development of the cross-border e-commerce industry in the FTZ

(continued)

(continued)

Question	Causes of the problem	Solution
Cross-border logistics transportation issues	Scholars from all sides generally believe that the cross-border logistics problem has become a bottleneck and the biggest pain point restricting the development of cross-border e-commerce in China's FTZ. Affected by the high cost of cross-border logistics, many transportation links and long timeliness, the FTZ has not formed a perfect cross-border logistics supply chain system, which has become an important bottleneck for the development of cross-border e-commerce in the FTZ	Further improve the infrastructure, strengthen the construction of overseas warehouses, build a complete supply chain and strengthen the cross-border logistics system

9.1.3.2 Comprehensive Experimental Zone Cross-Border E-Commerce

Since 2015, China has established comprehensive experimental zones for cross-border e-commerce (referred to as comprehensive pilot zones) in 59 cities, including Hangzhou, Tianjin, Beijing and Shijiazhuang, with the main purpose of early and pilot implementation of technical standards, business processes, regulatory models and information construction in cross-border e-commerce transactions, payments, logistics, customs clearance, tax refunds and foreign exchange clearance, etc., and through system innovation, management innovation, service innovation and collaborative through system innovation, management innovation, service innovation and collaborative development, we will solve the deep-rooted conflicts and institutional problems in the development of cross-border e-commerce, build a complete international e-commerce industry chain and ecological chain, and gradually establish a set of management system and rules suitable for and guiding the development of international e-commerce, so as to provide reproducible and propagable experience for the healthy development of China's cross-border e-commerce. In this context, China's cross-border e-commerce transaction volume increased from RMB 5.4 trillion in 2015 to RMB 9 trillion in 2018. As a kind of early and pilot economic function zone, the Comprehensive Pilot Zone is an institutional highland for the development of cross-border e-commerce industry in China and plays an important role in the digital transformation of China's foreign trade. At present, China's comprehensive pilot zones are mainly concentrated in China's southeastern coast and some provincial capitals, and the mature experience in customs clearance and logistics has not been fully applied, which seriously restricts the development of China's cross-border e-commerce and the transformation of digital trade.

On July 24, 2018, the State Council approved the establishment of comprehensive pilot zones for cross-border e-commerce in 22 cities, including Beijing, adding to the 13 comprehensive pilot zones established in the first and second batches, China has 35 comprehensive pilot zones for cross-border e-commerce, marking a new stage of development of “standardization + innovation” for China’s cross-border e-commerce. On June 13, 2019, Premier Li Keqiang pointed out that “cross-border e-commerce is a major trend in the development of international trade, which can drive more enterprises to participate directly in international trade, and is also conducive to the integration and development of large and small enterprises, and promote the upgrading of domestic manufacturing industries and the growth of brands; relevant departments should improve policies, innovate regulation, and increase support”.

There are still several problems with China’s cross-border e-commerce pilot zones:

1. The formulation of laws and policies lags behind the development of the market, and China has not yet made clear provisions on the definition, nature and regulatory principles of cross-border e-commerce at the legal level. The policy of cross-border e-commerce pilot zones allows for early and pilot implementation, but the efforts to promote the reform of “management and service” in various places are uneven, resulting in poor communication and coordination between the management agencies of cross-border e-commerce pilot zones and other regulatory departments, and the formulation of relevant regulations and policies on customs clearance, quarantine, finance, taxation and foreign exchange lag behind the market development.
2. Regulatory procedures and approval processes need to be further streamlined, the first and second batches of cross-border e-commerce pilot areas in the early and pilot process through system innovation, management innovation and service innovation launched a series of customs, inspection, taxation, exchange and other facilitation measures, but still can not meet the development of new cross-border e-commerce business.
3. Cross-border e-commerce B2B model innovation results are insufficient, at present, only some of the cross-border e-commerce comprehensive pilot zones summarize the cross-border e-commerce B2B model, the experience and results in building an online comprehensive service platform, optimizing customs clearance procedures, innovative financial support model, layout of overseas warehouses and the establishment of statistical monitoring system, which is different from the Party Central Committee and the State Council’s request for cross-border e-commerce comprehensive pilot zones to focus on the cross-border e-commerce B2B model in There is still a big distance between this and the breakthrough innovation in technical standards, business processes, supervision mode and information construction required by the CPC Central Committee and the State Council.
4. Cross-border e-commerce pilot zones do not have enough innovation momentum, and they have the important historical mission of “bold exploration and innovative development”. At present, the second and third batches of cross-border

e-commerce pilot zones are still in the stage of replicating and promoting experience, and there are not many new experiences and practices in terms of substantive policy innovation, model innovation and system innovation that combine local characteristics.

Therefore, cross-border e-commerce pilot areas must all promote the integrated development of cross-border e-commerce and manufacturing industries, constantly innovate, and constantly promote the transformation and upgrading of traditional and foreign trade enterprises, and accumulate new momentum for a new round of development.

9.1.3.3 The Results of the Construction of the Free Trade Zone and the Comprehensive Test Area

(1) Formation of a policy system for institutional innovation

During the “13th Five-Year Plan” period, the national level has promoted a total of 173 results of system innovation in the Pilot Free Trade Zone to the whole country, and these “good seeds of the system” have taken root in the country, further enhancing the level of openness, administrative efficiency, development momentum and economic vitality. At the national level, the relevant departments of the State Council to develop customs clearance, inspection, such as the facilitation of customs clearance system, negative list supervision system, product quality and safety monitoring system, payment foreign exchange management methods, tax management standardization and facilitation system and payment institutions to settle foreign exchange market access system. At the local level, the China (Hangzhou) Comprehensive Pilot Zone for Cross-border E-Commerce alone has introduced a list of 85 system innovations in two batches, and other comprehensive pilot zones for cross-border e-commerce have also introduced policies and systems adapted to cross-border e-commerce in conjunction with the actual local situation, creating a good institutional environment for the development of cross-border e-commerce.

(2) The formation of a number of experience can be replicated for the whole country

According to the summary of the FTZ released by the Ministry of Commerce last year, over the past six years, at the central level, the FTZ has replicated and promoted a total of 260 institutional innovations to the country, including 143 centralized replication, 43 “best practice cases”, and 74 independent replication and promotion of relevant departments. At the local level, according to incomplete statistics, the 18 pilot FTZs have promoted 1151 system innovations in their provinces. The replication and promotion of institutional innovation has promoted the reform consciousness, openness level, administrative efficiency, development momentum and economic vitality around the country, driving the continuous optimization of the national business environment.

In October 2017, the Ministry of Commerce and other 14 departments officially issued the Letter on Replication and Promotion of Mature Experiences and Practices

Formed in Comprehensive Pilot Zones for Cross-border E-Commerce, which replicated and promoted the mature practices in 12 aspects formed in the “six systems and two platforms” of the 13 comprehensive pilot zones for cross-border e-commerce established in the first and second batches to the whole country, covering the achievements made in cross-border e-commerce transactions, payment, logistics, customs clearance, tax rebates, foreign exchange clearance and other aspects such as technical standards, business processes, supervision mode and information construction on an early and pilot basis, which provide reproducible and extendable experiences and practices to promote the healthy development of China’s cross-border e-commerce and strongly support the transformation and upgrading of China’s foreign trade and innovative development.

(3) Form a set of rules to lead the development of global cross-border e-commerce

In 2017, China Customs became the Chair of the WCO Working Group on Cross-Border E-Commerce and was entrusted by the WCO to lead the development of the Framework of Standards for Cross-Border E-Commerce. The Framework of Standards for Cross-Border E-Commerce was approved by the WCO with June 2018, which provides a global benchmark standard for WCO cross-border e-commerce regulation and services, marking China’s pivotal role in international cross-border e-commerce rules. China’s contribution to the development of the Cross-border E-Commerce Standard Framework includes the following five aspects: the introduction of the management concept of “Inclusive and Prudent, Innovative and Collaborative”, the sharing of business models such as online direct purchase and bonded preparation, the innovation of regulatory models, the enrichment of trade facilitation measures and the exploration of a propagable statistical methodology. China was able to make such an important contribution to the development of the Cross-border E-Commerce Standard Framework, mainly from the rich practical achievements of China’s cross-border e-commerce free trade zones and comprehensive pilot zones.

(4) The formation of cross-border e-commerce industry clusters with significant agglomeration effect

An important task for China to set up cross-border e-commerce FTZs and comprehensive pilot zones is to build a complete industrial chain and ecological chain for cross-border e-commerce and form a cross-border e-commerce industry gathering and development. At present, the industrial aggregation in China’s cross-border e-commerce FTZs and pilot zones is mainly reflected in the online integrated service industry cluster and the offline industrial park industry cluster.

(5) Formation of important initiatives to support major national development strategies

The construction and development of China’s cross-border e-commerce free trade zones and comprehensive pilot zones have formed important initiatives to effectively support the “Belt and Road” initiative, “Internet+” and innovation-driven development and other major national development strategies. In the context of the “One Belt and One Road” initiative, the cross-border e-commerce pilot zone is not only

an innovative pilot zone for cross-border e-commerce cooperation between China and countries and regions along the “One Belt and One Road”, but also an important vehicle for promoting the “One Belt and One Road” construction. It is also an important carrier for the construction of “One Belt, One Road”. The construction and development of China’s cross-border e-commerce FTZs and pilot zones are gradually becoming an important support for the national strategy of “Internet+”. In recent years, the turnover of China’s cross-border e-commerce FTZs and pilot zones has increased exponentially, which is an important driving force of China’s foreign trade growth and a new highlight of innovative development, and has become an important engine of the innovation-driven development strategy.

9.1.4 E-WTO

9.1.4.1 Cross-Border E-Commerce Under the WTO System

The WTO’s Work Plan on Electronic Commerce defines electronic commerce as “the production, distribution, marketing, sale, or delivery of goods or services by electronic means.” However, when the WTO defines e-commerce, it specifically states that it “applies only to the Plan”, which shows that the WTO is cautious about the definition.

9.1.4.2 Construction of “eWTO” Regulation for Cross-Border E-Commerce

In the cross-border e-commerce field and Hangzhou and other coastal areas the goals are to form a differentiated competition and cooperation, continue to work on new international trade rules, and to provide a good environment and policy support for the development of EWTO. EWTO is an international trade rule and EWTP is a commercialized trade service platform; they are essentially different (Fig. 9.3).

EWTO (Electronic World Trade Organization) is an international intergovernmental organization established on a voluntary basis based on the existing World Trade Organization (WTO) framework system, which aims to promote the supervision, management and implementation of the ETA, customs rules, access agreements, quality management and trade services, and to regulate the operation of EWTP. Under the principles of fairness, freedom, sharing, inclusiveness and development, EWTP promotes the healthy and rapid development of international trade and global peace and prosperity.

The current e-commerce regulations under the WTO framework cannot meet the needs in reality nowadays. During his visit to Indonesia on 16 April 2016, WTO Director-General Azevedo said that there is no consensus among member states on the classification of goods, not to mention the more important issues of taxation

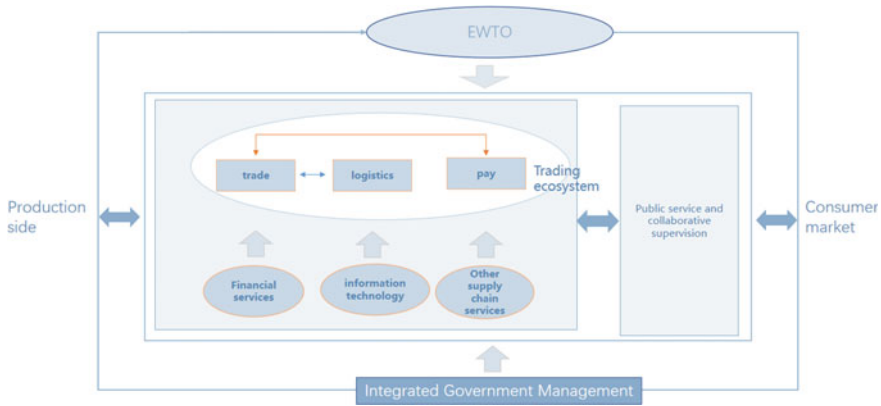


Fig. 9.3 EWTO development ecosystem

and consumer rights. Therefore, in this context, it is very necessary to improve the cross-border e-commerce rules.

9.1.4.3 Opportunities Brought by E-WTO for the Development of Cross-Border E-Commerce

- (1) To help small and micro enterprises and natural persons engaged in cross-border e-commerce

Generally speaking, it is difficult for small and medium-sized enterprises and natural persons to carry out cross-border e-commerce activities directly. EWTO can help them to carry out such activities, which is the core concept of EWTO, so that more people can carry out cross-border e-commerce activities, and in turn, more consumers can improve their existing living standard, and even improve the living standard of the whole world. In the US, many SMEs do 95% of their cross-border e-commerce activities through eBay.

- (2) Ensuring the protection of consumer rights and interests in cross-border e-commerce

The protection of consumer rights is an issue that is of concern to every government, and if not addressed properly, it will largely prevent cross-border e-commerce from moving forward. The eWTO can make a difference in this regard by setting out a series of strict rules to ensure that the cost of consumer redress is reduced, for example, by requiring platforms to pay compensation to consumers if certain conditions are met.

- (3) Provide intellectual property protection in cross-border e-commerce activities

In the course of cross-border e-commerce activities, the eWTO must assume a certain responsibility to create a fair market environment and must treat intellectual property

rights as a bottom line that cannot be crossed. In consumer protection law, platforms may be liable under certain circumstances, and in the area of copyright, the “safe harbour” principle can be used for online service providers.

9.2 Macro Environment and Current Situation of Cross-Border E-Commerce Development in China

9.2.1 Macro Environment of Cross-Border E-Commerce Development

With the e-commerce industry currently booming and the global economy moving towards integration, the cross-border e-commerce sector is still a blue ocean. Therefore, China’s cross-border e-commerce industry will usher in a new development opportunity. So far, China’s export e-commerce has developed a variety of business models, from the primitive B2B model to B2C foreign trade platforms, to B2B2C and C2C platforms. Cross-border e-commerce platforms have shifted from crude to refined, making great efforts in standardization and regularization.

9.2.1.1 Political Environment

China’s enhanced international status has contributed to the growth of China’s foreign trade and the development of its economy and international status, helping China to be in a more favourable position in international trade and helping domestic enterprises to truly realize their “go global” strategy: China has now signed free trade agreements with ASEAN, Chile, Pakistan, New Zealand, Singapore, Peru, Costa Rica, Iceland and Switzerland. The Shanghai Free Trade Zone, Guangdong Free Trade Zone, Tianjin Free Trade Zone and Fujian Free Trade Zone have been approved one after another, greatly facilitating the development of China’s foreign trade and creating a favourable environment for domestic enterprises’ export trade. International policy differences have brought new opportunities and challenges to cross-border e-commerce, and many countries have brought a favourable policy environment to cross-border e-commerce.

From a national strategic perspective, the revitalization of the sluggish foreign trade market through export cross-border e-commerce has become an important means of national economic development. In particular, the implementation of the “One Belt, One Road” strategy has optimized taxation, payment, customs clearance and overseas warehouses, creating a more convenient environment for export cross-border e-commerce. Under the new situation of “One Belt, One Road” and “Internet+”, China’s export cross-border e-commerce has been greatly developed. It is expected that more policies conducive to cross-border export e-commerce will

be introduced in the future, and cross-border export e-commerce will continue to develop rapidly.

9.2.1.2 Economic Environment

The development of cross-border e-commerce in China is still dominated by exports and supplemented by imports, and is gaining momentum. In recent years, China's "Internet+Foreign Trade" strategy has promoted the development of cross-border e-commerce and helped traditional foreign trade enterprises to transform and upgrade through the Internet. The world economy is picking up and developed countries are the first to recover. The most important trade markets for China's exporters are the United States and developed European markets. The United States, Germany, the United Kingdom and Spain are the main markets of China's export e-commerce. In this round of economic recovery, developed countries in Europe and the United States are the first to recover, and the recover trend is relatively stable, which is beneficial to China's external market.

Domestic production costs are rising and industrial transformation is accelerating. At present, although many Chinese enterprises are in the foreign export business, most of them are small and medium-sized enterprises (SMEs), which still adopt the means of selling more at lower margins. But now labour costs are rising, leading to an increase in the cost of export enterprises, and if they continue to use the measure of selling more at lower margins, they will weaken the competitiveness of their products abroad, and it will be more difficult for these small and medium-sized export enterprises to survive.

9.2.1.3 Social Environment

On the demand side, the amount of overseas e-commerce spending is constantly increasing. In recent years, more and more overseas consumers are choosing products that are "made in China" and the number of overseas online purchases is also increasing. The overall social environment in the world is very favourable to China. In overseas markets, consumption patterns around the world are changing, and there is still a lot of room for online consumption; in terms of trade, traditional export methods can no longer meet the needs of consumers nowadays, and cross-border e-commerce can better meet the diverse needs of consumers.

More and more overseas consumers are beginning to recognize Made in China. Cross-border e-commerce has been growing rapidly since 2005, and since then, in order to establish their own brand and highlight their own product features, they have gradually abandoned their policy of selling more at lower margins and started to design their products to meet consumer preferences, in order to stand out from the crowd of competitors. Overseas consumers used to think that Made in China was "light on quality and low on price", but with the continuous development of cross-border e-commerce in China, the quality of Made in China products has been

well guaranteed and the brand effect has been excellent, which has created a good environment for the sustainable development of export e-commerce.

9.2.1.4 Technical Environment

The Internet is the “catalyst” for the maturation of cross-border e-commerce. As an important stronghold for online companies to expand into overseas markets, cross-border e-commerce has developed along with the Internet, which is playing an increasingly important role in helping exporters provide services. It is currently in a phase of rapid development, change and upgrade, with broad development prospects. For cross-border e-commerce platforms, the application of big data enhances the basic functions of the platform, providing information matching and transactions, which leads to changes in the business model of the platform industry.

New technologies in the digital economy can show a new path to the development of cross-border e-commerce. Cross-border e-commerce is prone to information asymmetry, and this information asymmetry will increase the transaction costs of both parties, which in turn will reduce the market competitiveness of cross-border e-commerce. Blockchain technology can reduce transaction costs and also enable fast payment. The core feature of blockchain is that information is completely transparent and non-tamperable, which helps reduce commercial fraud in the market and ensures that customers can enjoy the best service. Nowadays, cross-border e-commerce has replaced traditional trade as a new way of international trade, which is of great help to improve the brand influence of Made in China and the transformation and upgrading of foreign trade.

9.2.2 Current Status of Cross-Border E-Commerce Development

In recent years, with the continuous improvement of Internet technology, the global Internet penetration rate has continued to rise: according to data from the Digital 2021 report released by Hootsuite in January 2021, the number of global Internet users reached 4.66 billion as of January 2021, an increase of 7.3% compared to the same period in 2020, and the current global Internet penetration rate has reached 59.5%. The number of Internet users worldwide reached 4.6 billion by January 2021, an increase of 7.3% compared to the same period in 2020, and the current global Internet penetration rate has reached 59.5%. On the other hand, the impact of the epidemic has led to a surge in global consumer demand, and the rapid rise of e-commerce as a preferred shopping channel for consumers is largely related to its ‘no-touch’ nature. At the same time, China’s cross-border e-commerce and other new forms of foreign trade are moving forward at a rapid pace, increasing the capacity of foreign trade. According to China Customs statistics, China’s cross-border e-commerce trade grew

by 28.6% in the first half of 2021, with export trade growing by 44.1%, significantly higher than the growth rate of foreign trade; from January to July 2021, China's import and export, export and import scales were RMB 21.3, 11.7 and 9.7 trillion respectively, all hitting record highs for the same period, with year-on-year growth of 24.5, 24.5 and 24.4%, with all three growth rates at a 10-year high.

9.2.2.1 Cross-Border E-Commerce has Entered a Mature Period

In 2021, because the Party Central Committee, with Comrade Xi Jinping at its core, has calmly responded to the century-old changes and the epidemic of the century, promoted deep reforms with a high level of openness and pushed for high-quality development, China's economic development and epidemic prevention and control have maintained its global leadership, and foreign trade imports and exports have achieved faster growth, with a new record scale and steadily improving quality. According to customs statistics, the total value of China's import and export of goods trade in 2021 will be RMB 39.1 trillion, an increase of 21.4% over 2020 (Table 9.3).

Table 9.3 Foreign trade import and export characteristics of China in 2021

Projects	Features overview	Data support
Feature 1	Annual import and export scale to a new level	In 2021, in dollar terms, China's imports and exports reached US\$6.05 trillion
Feature 2	With major trading partners stable growth in both imports and exports	In 2021, China's imports and exports to ASEAN, the European Union, the United States, Japan and South Korea were 5.67, 5.35, 4.88, 2.4 and 2.34 trillion yuan, an increase of 19.7%, 19.1%, 20.2%, 9.4% and 18.4%, respectively
Feature 3	Further optimization of trade patterns	In 2021, exports will be 13.24 trillion yuan, up 24.4%; imports will be 10.84 trillion yuan, up 25%. During the same period, processing trade imports and exports of 8.5 trillion yuan, an increase of 11.1%, accounting for 21.7%
Feature 4	Foreign trade business entities to effectively stimulate the vitality of private enterprises import and export more active	China has import and export performance of 567,000 enterprises, an increase of 36,000, of which, private enterprises import and export 19 trillion yuan, an increase of 26.7%, accounting for 48.6%
Feature 5	Export of electrical and mechanical products, the imports are maintaining a good growth trend	In 2021, China's exports of mechanical and electrical products 12.83 trillion yuan, an increase of 20.4%, accounting for 59% of the total value of exports

9.2.2.2 Cross-Border E-Commerce Market Size

(1) Market size continues to expand

In recent years, as China’s cross-border e-commerce industry as a whole has shown a thriving phenomenon, the market scale has continued to expand and the number of cross-border e-commerce comprehensive test zones has increased, the market scale of China’s cross-border e-commerce will further increase and it is expected that by 2022, the total import and export transactions of China’s cross-border e-commerce will reach RMB 15.7 trillion. According to the “As the Sun Rises—2021 China Export Cross-border E-Commerce Development Research Report” released by Yioji, it is known that the transaction volume of China’s cross-border e-commerce will reach RMB7.73 trillion in 2021 and is expected to exceed RMB9 trillion by 2023 (Fig. 9.4).

(2) Cross-border e-commerce import and export to maintain good development momentum

In terms of the structural composition of imports and exports, China’s cross-border e-commerce grew rapidly in 2020, with 2.45 billion import and export manifests being processed and released through the Customs cross-border e-commerce management platform, an increase of 63.3% year-on-year. During the “Double 11” period, a total of 52.27 million import and export manifests were processed through the unified version of the Customs cross-border e-commerce import and export system, an increase of 25.5% compared to last year. China’s cross-border e-commerce continued its strong development in the first half of 2021, with total imports and exports reaching RMB886.7 billion, up 28.6% year-on-year. Of this, exports were RMB 603.6 billion, up 44.1%, while imports were RMB 283.1 billion (Fig. 9.5).

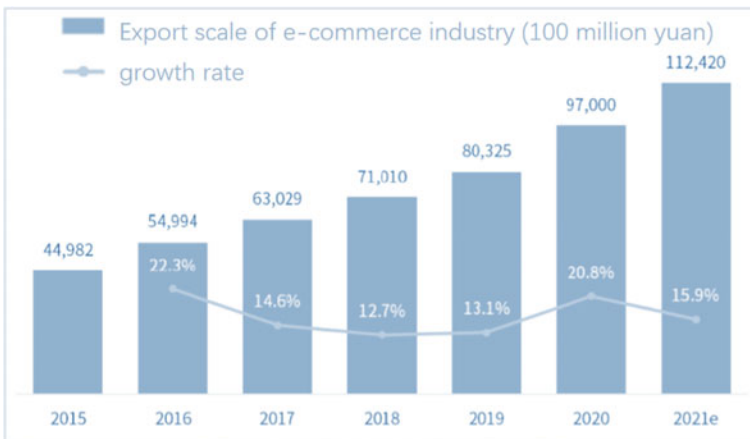


Fig. 9.4 Export cross-border e-commerce transaction size and growth rate. Data source NetEconomics

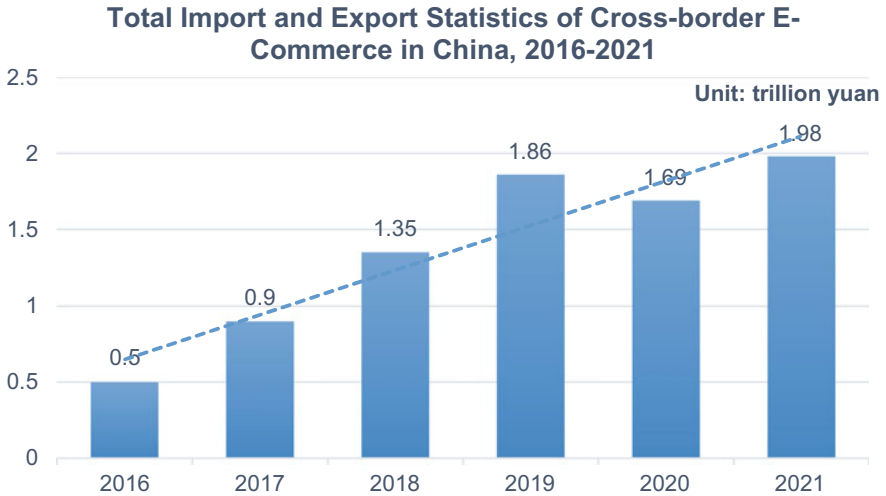


Fig. 9.5 Total import and export statistics of China's cross-border e-commerce. *Data source* Compiled by China Business Industry Research Institute

(3) The number of comprehensive cross-border e-commerce test zones is increasing

The China Comprehensive Pilot Zone for Cross-border E-commerce is a city region established in China for early and pilot implementation of the comprehensive nature of cross-border e-commerce, and was established to conduct early and pilot implementation of technical standards, business processes, regulatory models and information construction in cross-border e-commerce transactions, payment, logistics, customs clearance, tax rebates and foreign exchange clearance, etc., and through system innovation, management innovation, service innovation and collaborative development, crack cross-border. Through system innovation, management innovation, service innovation and collaborative development, we will crack the deep-rooted contradictions and institutional problems in the development of cross-border e-commerce, build a complete industrial chain and ecological chain for cross-border e-commerce, gradually form a set of management system and rules that can adapt to and lead the development of global cross-border e-commerce, and provide reproducible and propagable experience for promoting the healthy development of cross-border e-commerce in China (Fig. 9.6).

9.2.2.3 Policies to Help China's Cross-Border E-Commerce

Tian Guofeng, executive deputy secretary general of the China Association of Trade in Services, has said that China's cross-border e-commerce has been booming since 2015, with import and export volumes increasing from RMB36.02 billion in that year to RMB186.21 billion in 2019, with an average annual growth rate of about 38.3 per

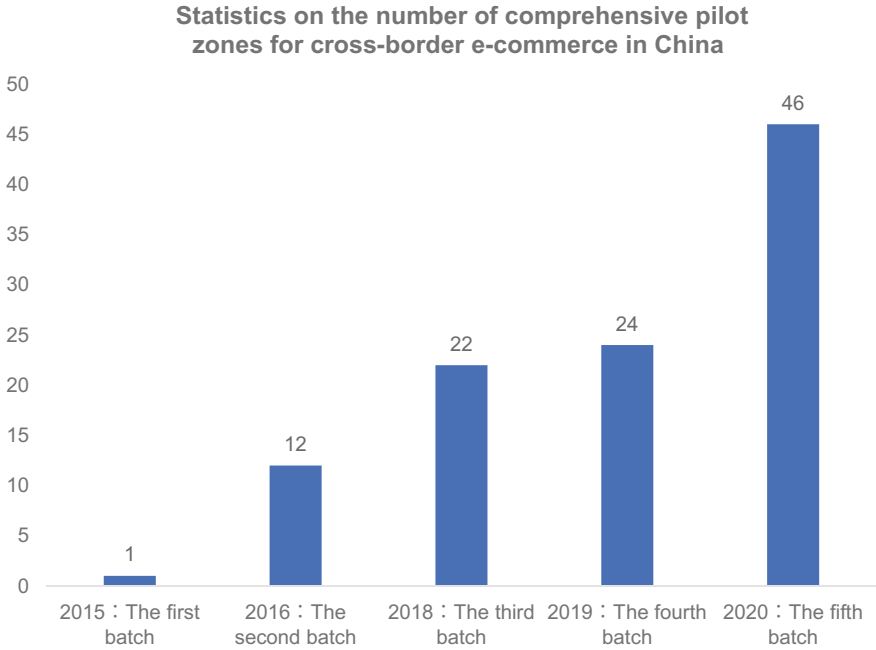


Fig. 9.6 Statistics on the number of comprehensive pilot zones for cross-border e-commerce in China

cent. China’s cross-border e-commerce flourished even more during the new crown pneumonia epidemic this year. In addition, China Customs has launched B2B cross-border e-commerce, with import and export volumes reaching RMB187.39 billion in the first three quarters and expected to continue to grow at a high rate throughout the year.

In recent years, China has introduced a series of policies relating to the regulation of cross-border e-commerce retail imports and exports, the regulation of returns, payment management and the “negative list” of goods exported, all of which have contributed positively to the development of cross-border e-commerce in China. As cross-border e-commerce continues to develop, global cross-border e-commerce will become increasingly regulated. Table 9.4 provides a summary of China’s cross-border e-commerce support policies in recent years.

9.2.2.4 China’s Export Cross-Border E-Commerce Development Trend

- (1) Rising concentration in the cross-border e-commerce industry, promoting the establishment of enterprises’ own brands

With a series of policies promulgated by China, the leading enterprises of cross-border e-commerce will continue to expand and seize this market, while those small

Table 9.4 Summary of cross-border e-commerce support policies sorted out

Release time	Release unit	Policy name
January 2017	Development and Reform Commission	Guidance Catalogue of Key Products and Services for Strategic Emerging Industries
January 2018	Office of the State Council	Guiding Opinions on Promoting the Construction and Development of Agricultural High-tech Industry Demonstration Zones
January 2018	Office of the State Council	Opinions on the Collaborative Development of E-Commerce and Express Logistics
February 2019	Ministry of Commerce and other 12 ministries	Guiding Opinions on Promoting the Development of Platform Economy in Commodity Trading Markets
March 2019	State Council	2019 Two Sessions
June 2019	National Development and Reform Commission, Ministry of Ecology and Environment, Ministry of Commerce	Promote the renewal and upgrading of key consumer goods to smooth the implementation of the resource recycling program
November 2019	National Tax Administration	Announcement on Issues Relating to the Approved Levy of Enterprise Income Tax for Retail Exports in the Comprehensive Pilot Zone for Cross-border Electronic Commerce
December 2019	Ministry of Finance	The List of Goods Imported by Cross-border E-Commerce Retail (2019 Edition)
January 2020	Ministry of Commerce and other six ministries	Notice on the expansion of cross-border e-commerce retail import pilot
March 2020	General Administration of Customs	Announcement of the General Administration of Customs on Regulatory Matters Relating to the Return of Goods for Cross-border E-Commerce Retail Import
May 2020	State Administration of Foreign Exchange	Notice on Supporting the Development of New Trade Patterns
June 2020	General Administration of Customs	Announcement of the Pilot Project on Cross-border E-Commerce Business-to-Business Export Supervision
August 2020	State Council	Opinions on Further Improving the Stabilization of Foreign Trade and Foreign Investment

(continued)

Table 9.4 (continued)

Release time	Release unit	Policy name
November 2020	Office of the State Council	The Implementation Opinions on Promoting the Innovative Development of Foreign Trade
March 2021	The Fourth Session of the Thirteenth National People's Congress	Outline of the Fourteenth Five-Year Plan of the National Economic and Social Development of the People's Republic of China and the Vision 2035
July 2021	Office of the State Council	Opinions of the General Office of the State Council on Accelerating the Development of New Business Patterns and Modes of Foreign Trade
July 2021	Ministry of Commerce	The 14th Five-Year Plan for Business Development
October 2021	Ministry of Commerce	The 14th Five-Year Plan for the Development of Electronic Commerce
November 2021	Ministry of Commerce	The 14th Five-Year Plan for Business Development

Source Chinese government website, State Administration of Taxation, General Administration of Customs, State Administration of Foreign Exchange, Ministry of Commerce

enterprises will face the fate of being annexed or eliminated, and the concentration of cross-border e-commerce industry will increase. Now more and more cross-border e-commerce enterprises are beginning to pay attention to the cultivation of brands, to design their own products in response to consumer preferences, to play their own brand effect to overseas consumers, and to enhance the market competitiveness of the enterprises themselves (Fig. 9.7).

(2) Cross-border e-commerce product categories continue to be enriched, and enhancing the marketing conversion rate has become the focus of development

The scale of cross-border e-commerce in China is getting bigger and bigger, and consumers' demands are becoming more and more diversified. The customer traffic of cross-border e-commerce is usually difficult to maintain a high rate of traffic increase after reaching a certain scale, and improving the traffic conversion rate will become an important factor for the sustainable development of cross-border export e-commerce enterprises. Currently, as cross-border e-commerce platforms continue to move to the cell phone, each enterprise has begun to build its own online platform and look for multiple sales channels; in addition, it has begun to continuously invest in product innovation as a way to increase the repeat rate of old customers, enhance user stickiness and improve the marketing conversion rate.

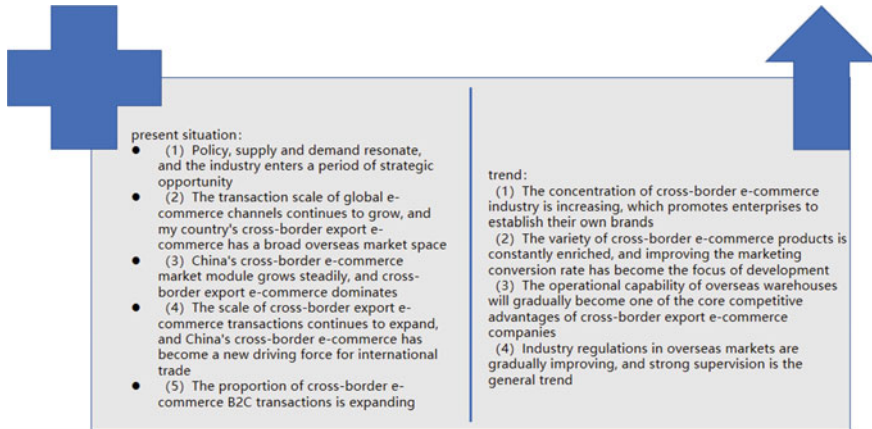


Fig. 9.7 Current situation and trends of cross-border e-commerce development in China

- (3) The operational capability of overseas warehouses will gradually become one of the core competitive advantages of cross-border export e-commerce enterprises

As global consumers' demand for online shopping continues to rise, cross-border e-commerce enterprises can build their own overseas warehouses to shorten the delivery time after customers' orders are placed, improve customer satisfaction, and thus increase sales. This will help cross-border e-commerce enterprises to realize "localized" operation, realize high-efficiency return and exchange services, and keep pace with local after-sales service, thus improving consumers' consumption experience.

- (4) The industry regulations in overseas markets are gradually improving, and strong regulation is the trend

As a rapidly developing new industry, cross-border e-commerce is often ahead of government regulation and legislation in terms of its innovation. However, in recent years, laws and regulations in some major foreign countries and regions have been gradually revised and improved, especially in terms of taxation. Since 2018, most U.S. states and cities have clearly provided for the collection and payment of sales tax (Sales Tax) by e-commerce platforms; in 2019, many European countries require e-commerce platforms to assume greater responsibility for tax compliance; from January 1, 2021, the United Kingdom provides for the collection and payment of value added tax (VAT) on behalf of some goods by e-commerce platforms. The EU will also implement it on July 1, 2021. The new crown epidemic in the past few years has added a lot of pressure to the finances of each country, so cross-border e-commerce enterprises must create a legal operating market order.

9.3 Typical Markets for Cross-Border E-Commerce Abroad

9.3.1 Europe and the United States E-Commerce Market—Amazon

The United States is the world’s largest economy and the world’s second largest e-commerce market, with annual sales of \$587 billion and online turnover accounting for 11.3% of overall turnover. With a population of 328 million, the U.S. consumer market can continue to grow from its population base to its consumer index (Fig. 9.8).

Amazon is undoubtedly the dominant player in the U.S. e-commerce industry, the number of active people in a month has exceeded 2 billion, while the second place eBay’s monthly active population is only about 640 million, even without counting eBay’s own business, Amazon also by more than half of the market share (Fig. 9.9).

Amazon has sites in many countries, in fact, the largest number of monthly active people per month is in the United States, with about 2.3 billion, but this is only 39% of all website traffic in the United States. And from the 2019 annual Amazon report, we can know that Amazon’s GMV is about \$335 billion, while the GMV of the United States is about \$235 billion. Although Amazon’s human traffic in the United States only accounts for 39% of the total, the United States contributes 70% of Amazon’s sales, which shows that the price of orders per capita in the United States is higher.

The U.S. is Amazon’s home base, so generally Amazon’s new projects will be implemented in the U.S. first, and then spread to other countries. For example, Amazon is now improving its logistics network, ready to start implementing the 1 day delivery service after consumers place orders.

#	Type	Name	Region/Country	US Visits/month
1		Amazon	Global	2.3B
2		ebay	Global	637.9M
3		Walmart.com	USA	446.4M
4		Target.com	USA	249.5M
5		Etsy	Global	170.3M
6		Wayfair	North America,Europe	86.7M
7		Overstock	USA	26.4M
8		Wish	Global	24.8M
9		Newegg	USA,Canada	22.8M
10		Sears	USA	17.5M

Fig. 9.8 U.S. e-commerce platform ranking

#	Country	Visits/month	% of Total
1	United States	2.3B	39%
2	Janpan	576.6M	10%
3	Germany	457.7M	8%
4	United Kingdom	416.9M	7%
5	India	323.3M	6%
	Others	1.7B	30%

Fig. 9.9 Amazon in the United States

9.3.2 East Asian E-Commerce Market—Shopee

Established in Singapore in 2015, Shopee is the leading e-commerce platform in Southeast Asia and Taiwan, and its services cover seven markets, including Singapore, Malaysia, Philippines, Taiwan, Indonesia, Thailand and Vietnam, as well as cross-border business offices in Shenzhen, Shanghai and Hong Kong, China. In 2019, Shopee’s total orders reached 1.2 billion, an increase of 100.5% compared to last year.

According to App Annie, an authoritative mobile data analysis platform, Shopee can account for the top five in the shopping app downloads worldwide in FY2019, while taking the top spot in Southeast Asia, Taiwan and Vietnam (Fig. 9.10).

Shopee is an e-commerce platform for third-party sellers to sell pings, and was initially established as a mobile app for consumer-to-consumer transactions. In March 2017, Shopee Shenzhen R&D center was established. There are now several business groups such as Seller Group, ToC Group, Supply Chain Group, Financial Services Group, etc. Shopee is now mainly used to sell a variety of goods and supports both PC and mobile terminals. Since its inception, Shopee has been active in six of the largest economies in South East Asia, with Taiwan now the most popular market and Shopee has also expanded into Brazil and Mexico, with a Brazilian version of its website and app. In addition to the platform, it also owns Shopee Mall, which




#	Type	Name	Region/Country	US Visits/month
1		Shopee	Southeast Asia	197.8M
2		Lazada	Southeast Asia	161.7M
3		Tokopedia	Indonesia	72.4M
4		Bukalapak	Indonesia	26.8M
5		Tiki	Vietnam	22.0M

Fig. 9.10 Shopee in East Asia

offers brands from Southeast Asia and around the world. Nearly 5,000 official stores such as Unilever, Samsung, Puma, and Huawei sell on Shopee Mall. Shopee also hosts special sales and promotions, including Super Brand Day for global brands, the 9.9 Shopping Day on 9 September, the Double 10 on 11 November, and the annual Double 10 on 11 November. “Double 10” and the annual “Double 12” sale on 12 December.

9.3.3 EU E-Commerce Market—eBay

In 1999, eBay opened sites in Germany, Australia and the UK respectively. At that time, there was still only an online platform and offline purchases were not available, while now, eBay has 15 sites in Europe and the monthly active volume accounts for 24% of the total in Europe. In the ranking of European e-commerce, eBay can be ranked second (Fig. 9.11).

eBay has a global account system, which means that eBay’s model and policies do not differ from region to region, and that sellers selling the same items in different countries receive the same feedback. However, this does not mean that eBay automatically publishes all search results worldwide, and each site must be in the official local language.

Sellers who use eBay have two logistics options to choose from. Sellers can choose either the traditional direct mail method or use eBay’s Global Shipping Program (GSP), but the program is more expensive and generally used by few people, because the chemistry delivered by eBay will charge consumers for shipping costs, duties and excise taxes.

#	Country	Visits/month	% of Total
1	United States	637.9M	39%
2	United Kingdom	244.9M	15%
3	Germany	210.7M	13%
4	Italy	64.9M	4%
5	Australia	62.8M	4%
	Others	410.5M	25%

Fig. 9.11 eBay in Europe

9.3.4 Other Country and Regional Markets—MercadoLibre

MercadoLibre was founded by Marcos Galperin in Argentina in 1999, at a time when the world was in the midst of the “dot com bubble”. MercadoLibre was an auction site modelled on the eBay business strategy, and over time MercadoLibre grew into a major e-commerce platform. At the time of the New Crown epidemic, MercadoLibre was valued at over US\$59 billion, making it the most valuable company in Latin America, ahead of the world’s second largest mining company, Vale of Brazil.

MercadoLibre’s initial business credo of “always being a startup” has given way to innovation in the area of business management as the company has grown since its IPO. As Orlando, MercadoLibre’s Chief Technology Officer for North America, says: “MercadoLibre is always in Beta mode, we prefer quality and value over perfection”.

By developing and offering a wide range of products that meet the needs of its users, MercadoLibre ultimately creates an all-encompassing digital ecosystem for businesses and consumers, allowing tens of millions of consumers in Latin America to enjoy a wide range of Internet goods and services, including buying, selling, placing ads, logistics delivery, finance and payments.

The MercadoLibre e-commerce platform offers consumers and businesses millions of products and services to buy and sell. In addition to MercadoLibre and MercadoLibre Pago, described above, the MercadoLibre eco-services include: Mercado Shops (2010), a reliable platform for start-ups and small and medium-sized enterprises to conduct their digital business; Mercado Envios (2013), which provides easy online logistics security for the platform’s suppliers with easy online logistics security; Mercado Creditos (2017), which offers loans and financial services to platform users; MercadoLibre Publicidad, which promotes brand market positioning and increases sales; MercadoLibre also owns the MELI fund, which has invested in 17 Latin American startups and has a short-term investment plan for an additional US\$10 million in this region (Fig. 9.12).

The wide and diverse range of services makes MercadoLibre a one-stop platform for buyers and sellers, taking root in Latin America. MercadoLibre’s next new projects also include the expansion of MercadoCreditos financial services. The credit platform will begin offering loans to individual customers outside of the platform and no longer only to users who need to borrow from its platform to purchase goods, which is intended to help expand financial inclusion. MercadoCreditos’ growth goal is to become the largest fintech company in Latin America. Another development plan is to accelerate the establishment of logistics centers in different cities. In some locations, MercadoLibre congratulates the desire to be able to deliver on the same day of the order. In addition to this, the platform is testing a fresh food platform. In Argentina and Brazil, MercadoLibre has started a pilot program for same-day grocery delivery. Users need to buy groceries more often than they would normally buy other items on MercadoLibre, which in turn increases consumers’ continued access to the platform.



Fig. 9.12 MercadoLibre’s multiple ecological services map. *Photo credit* MercadoLibre

9.4 China’s Cross-Border E-Commerce Development Under the “One Belt, One Road” Strategy

9.4.1 Development Status

The year 2021 marks the 8th anniversary of the “Belt and Road” initiative. Since the “One Belt, One Road” initiative, China and the “One Belt, One Road” along the trade between the countries increasingly close. Specific table below shows the following characteristics (Table 9.5).

9.4.2 Policy Support

On February 9, 2021, President Xi Jinping issued a major initiative to deepen cooperation on customs trade security and customs clearance facilitation and to launch a pilot cooperation on “Smart Customs, Smart Border, Smart Connectivity” at the China-CEE Leaders Summit (Table 9.6).

Table 9.5 Characteristics of China’s cross-border e-commerce development under the “One Belt, One Road” strategy in 2021

Projects	Features overview	Data support
Feature 1	Steady increase in trade scale	From 2013 to 2021, the total import and export value of China and the countries along the “Belt and Road” increased from 646 trillion yuan to 11.6 trillion yuan, with an average annual growth rate of 7.5%, and the proportion of China’s total foreign trade value increased from 25 to 29.7% during the same period
Feature 2	Industry chain supply chain cooperation closer	From 2013 to 2021, intermediate products accounted for 49.8% of China’s exports to countries along the “Belt and Road” from 2013 to 56.2% in 2021, with exports of auto parts, textiles and lithium electronic batteries increasing by 26.7%, 14.1% and 50.4% respectively in 2021
Feature 3	Cooperation in energy, agriculture, mining and other fields is improving	In 2021, China’s imports of crude oil from countries along the “Belt and Road” 1.18 trillion yuan, up 44%; agricultural products 326.55 billion yuan, up 26.1%; metal ores 212.77 billion yuan, up 24.9%; 185.45 billion yuan of natural gas, up 38.96
Feature 4	Private enterprises are active	In 2021, private enterprises to the “Belt and Road” along the countries import and export 6.21 trillion yuan, an increase of 25.6%, accounting for the same period, China and the “Belt and Road” along the import and export of 53.5%, an increase of 0.8 percentage points

9.4.3 Opportunities and Challenges

9.4.3.1 New Opportunities

China has been sparing no effort to give economic and policy support to the countries along the “Belt and Road”, fully reflecting China’s strong desire for long-term cooperation and harmony with the “Belt and Road” countries. This can be seen from the rapid growth of the total import and export trade of the countries along the route since 2010. However, most of the products sold by cross-border e-commerce in the past were not essentially different and did not have their own unique competitiveness, but now consumers’ needs are diversified and many of them need high-end products that can reflect uniqueness, so if cross-border e-commerce enterprises do not make fundamental changes, they will hinder their progress. Therefore, “One Belt, One Road” provides a good opportunity for cross-border e-commerce companies to sell high-end and personalized goods to countries along the “One Belt, One Road” plan,

Table 9.6 China's cross-border e-commerce policy support under the "One Belt, One Road" strategy in 2021

Projects	Policy overview	Policy development
Policy 1	Implementing the "Three Wisdoms" concept and integrating the "Three Wisdoms" concept into business reform and development	Formulated and implemented the general administration of customs on accelerating the three wisdoms construction services "Belt and Road" high-quality development of the views
Policy 2	With "three wisdoms" cooperation as the leader, we will strive to build more highlights of "One Belt, One Road" and contribute to the modernization of the national governance system and governance capacity with customs wisdom and customs power	Formulation of the "14th Five-Year Plan" to promote the "Belt and Road" high-quality development of customs work program
Policy 3	Promote the mutual recognition and cooperation of "certified operator" (AEO) with the countries along the "Belt and Road"	China Customs has signed AEO mutual recognition agreements with 31 Belt and Road countries, and promoted the "Customs and Iron Pass" project

to continuously meet the diversified needs of local consumers, to improve consumer satisfaction, and to promote cross-border e-commerce platforms. The promotion of cross-border e-commerce platforms will promote the development of the economies of countries along the Belt and Road.

9.4.3.2 Challenges

The network infrastructure of some countries along the "Belt and Road" is not sound, and the Internet is not widely used, so there are not many people using online shopping, and many residents only use the Internet for chatting, but do not understand online shopping, which largely prevents cross-border e-commerce from moving forward.

In addition to incomplete infrastructure development, cross-border e-commerce faces four challenges.

The challenge	Specific content
Cross-border e-commerce talent shortage	In the process of cross-border e-commerce development, talents play a pivotal role, and their own abilities and qualities have a great impact on the competitiveness of e-commerce enterprises

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The challenge	Specific content
Logistics system needs to be improved	At present, many cross-border e-commerce businesses are facing the problems of low logistics level and imperfect logistics system in the process of development. The efficiency of customs clearance of items is low. In the process of cross-border e-commerce development, products need to be cleared overseas, and there are still contradictions between the postal channel clearance of these express items and the current customs management system, resulting in a relatively low efficiency of customs clearance of items
Inadequate network payment system	Cross-border payments still have security issues
After-sales service difficulties	In the process of cross-border e-commerce development, after-sales service has been a major problem, if consumers want to return the goods, then e-commerce companies need to bear the high logistics costs, consumers also need to pay a long waiting time

9.4.3.3 Countermeasures

In response to the challenge of unsound network infrastructure in the countries along the route, cross-border e-commerce enterprises will need to strengthen the penetration of e-commerce in the local area, for example, they can attract users quickly through product promotions, cultivate more cross-border e-commerce users and make local residents develop the habit of online shopping.

In addition, the different challenges faced require different responses to be given.

Countermeasures	Specific content
Accelerate the training of cross-border e-commerce talent	In order to better promote the development of cross-border e-commerce, the training of talents should be accelerated. Only with the support of talents can we promote the optimization of the form of cross-border e-commerce work, the improvement of service quality and the effective implementation of strategic plans
Development of overseas self-built logistics	In order to better improve the logistics system, cross-border e-commerce enterprises can also establish their own logistics system in foreign countries, thus reducing costs and increasing the sales of products

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Countermeasures	Specific content
Strengthen government cooperation	Improve customs clearance efficiency To further improve customs clearance efficiency, cross-border e-commerce companies have to cooperate with local governments
Establish bilateral payments	As early as 2017, China has already established a bilateral payment system with Russia, a “Belt and Road” country, leaving behind the dollar as an intermediary and using gold directly as a means of settlement, on the basis of which a bilateral payment system of PVP has also been set up

9.5 Opportunities and Challenges for the Future Development of Cross-Border E-Commerce in China

9.5.1 *New Opportunities*

The new development opportunity is brought by the epidemic. Under the influence of the global epidemic, consumers around the world have started to shop online either passively or actively, and online shopping is gradually replacing traditional shopping as a popular shopping method for people.

9.5.1.1 Global E-Commerce Development Space is Huge

The trend of commodity development now is refinement and direct access to consumers, and cross-border e-commerce is well suited to meet this development trend, while also creating a new mode of foreign trade orders in multiple and small batches. In addition, the development of cross-border e-commerce in these places is still lagging behind because of the imperfect logistics and underdeveloped payment system in many places, and the lack of many professional talents. What is amazing is that e-commerce in Europe and America is already well developed, but only 67–69% of the basic needs are met, 62–65% of the self-fulfillment needs are met, and only about 27% of the psychological needs are met. Therefore, in terms of geographical areas, consumer groups, product structure and variety, quality improvement and meeting people’s psychological and spiritual needs, the prospect of global e-commerce is still very broad, and there is huge room for expansion.

9.5.1.2 Digital Economy Development Opportunities

During the epidemic, China's cross-border e-commerce has developed rapidly with the help of national policies, for example, in 2020, China's "silk road e-commerce" cooperation with 22 countries continued to deepen, and the results of bilateral cooperation were accelerated; the State Council's new General Administration of Customs added "9710" and "9810" new ways of cross-border e-commerce export trade.

In the era of digital economy, cross-border e-commerce is bound to have a broader future. According to the "White Paper on China's Digital Economy Development (2020)" released by the China Academy of Information and Communication Technology, the scale of China's digital economy value added reached 35.8 trillion yuan in 2019, accounting for 36.2% of GDP, which indicates that the digital economy plays a pivotal role in the national economy and will become increasingly advantageous. The development of the digital economy to depth and with the trend of creating a new round of globalization, as well as China's unique mega domestic market development potential, will provide a very favorable historical opportunity for cross-border e-commerce to eventually move towards digital trade development.

9.5.1.3 Lower Threshold for Cross-Border E-Commerce for Enterprises

Some of the following factors will lower the threshold for cross-border e-commerce.

Factors	Specific content
Online exhibition, cross-border live broadcast and cloud negotiation and other marketing innovations	Under the epidemic, over 10,000 SMEs and traditional foreign trade enterprises in China have touched the Internet and gone online, lowering the time and space barriers to bring businessmen closer.
Digital customs clearance and clearing transaction links	Significantly improve transaction efficiency
Rich platform digital resources	Helping SMEs to accurately target consumer markets and needs
Cross-border supply system with global overseas warehouse network and independent stations	Provide more timely and convenient services, improve circulation efficiency, etc.

For example, overseas warehouses helped push the logistics timeframe for cross-border enterprises from 25 to 30 working days to three-day delivery and one-day delivery. E-commerce platforms such as Alibaba International Station launched online exhibitions, audio and video negotiations, and intelligent translation, customs clearance, logistics, and tax refund services, are greatly lowering the threshold for SMEs to enter cross-border e-commerce. New models such as cross-border live e-commerce and marketplace distribution trade also gained rapid development during

the 2020 outbreak. In the mobile digital life, the integration among industries has generated huge economies of scale and scope effects, which are constantly enriching and improving the cross-border e-commerce ecosystem.

9.5.2 Challenges

There are more and more cross-border e-commerce enterprises in China, and their total trade volume occupies a pivotal role in China's total foreign trade, especially the "One Belt, One Road" has been proposed, which makes its development space expand rapidly.

9.5.2.1 International Environmental Uncertainty Risk

Since the financial crisis in 2008, the global economy still has not fully recovered until today, and the emergence of the new crown epidemic in 2020 has dealt a direct blow to the global economy. The global economy became more complicated during the epidemic period, with the prices of a large number of raw materials and commodities rising. The economies of countries such as the United States and Europe are beginning to sulk, and it is possible that taxes on imports and exports will be adjusted in order to strengthen the protection of their e-commerce businesses. Although the epidemic has brought adverse effects, we must also note that the epidemic has also pushed the digital development of the entire economy, and also made the competition between countries start to become more and more intense, especially now that China's cross-border e-commerce is in the world's leading position, which will probably cause developed countries such as Europe and the United States to put forward higher specifications of challenges to Chinese sellers from the global governance of the digital economy and the top-level design of trade rules.

There is bound to be a trend of strengthening intellectual property rights, consumer protection, information security and overseas warehouse supervision. Chinese cross-border e-commerce is still relatively weak in this regard, but then there are many small and micro cross-border e-commerce enterprises that will use countries such as Europe and North America as their target markets, and the intellectual property rights in these countries are strictly regulated, and these small and micro enterprises are likely to be caught in legal disputes due to the lack of core technology and the lack of attention to the law, resulting in economic damage or even bankruptcy.

9.5.2.2 Increased Competition

Foreign epidemic is more serious, many factories have reduced production, and some even shut down production, while the goods made in China can be the first to start normal production. So many overseas consumers will be more and more inclined to

buy “made in China” products, especially some electronic products and epidemic prevention supplies, which are very popular among foreign consumers. But in the post-epidemic era, this advantage of China has disappeared because foreign factories are slowly starting to resume production, and the need for Chinese products overseas is slowly decreasing. The deepening of the international division of labor is coming to an end and trade protectionism are causing economic globalization to slow down and adjust. In addition, China is also facing the double impact of high-end brands from developed countries and low-cost goods from developing countries.

Now under epidemic situation, the global wealth gap is growing, the number of low-income groups is increasing, the ability to consume is declining, and many industries will transfer the amount of increased costs to export prices, and it is difficult for these companies to transfer this increase to foreign consumers. Cross-border e-commerce may face a difficult situation, that is, the trade volume increased, but in fact did not bring a lot of profits.

9.5.2.3 Shortcomings Such as Logistics and Payment

Many aspects of cross-border e-commerce are now carried out on the Internet, but “logistics, information flow, commodity flow” still need a supporting logistics system to complete the realization. The International Monetary Fund (IMF) defined the global crisis brought about by the new coronavirus pneumonia as “The Great Lock-down”, and the shortcomings of cross-border e-commerce were completely exposed during the epidemic, such as long supply chains and high logistics costs, and in the survey that most affected consumers’ shopping experience, these two factors account for the largest share in the survey of consumers’ perception of shopping experience. Logistics has always been an important part of the export process. However, China’s logistics is not perfect and lacks the corresponding infrastructure, so this also hinders the development of China’s cross-border e-commerce.

At present, since most countries have different payment methods, most cross-border e-commerce payments are made through third-party platforms, which leads to a problem that companies will deposit a lot of money in third-party platforms, which is not good for small and micro enterprises, especially when they can’t turn around their funds.

9.5.3 Countermeasures

The 14th Five-Year Plan proposes that China should build a new development pattern with the domestic circulation as the main body and the domestic and international circulation promoting each other. The new development pattern should make full use of the two domestic and international markets and resources, open up the blockages in production, distribution, circulation and consumption, actively promote imports

and exports, and build an integrated system with smooth internal and external circulation. To successfully realize the transformation to the new development pattern, need to promote a higher level of internal and external circulation with the support of new technologies. In the post-epidemic era, information technology, artificial intelligence, blockchain and other technological innovations are driving the high-quality development of China's cross-border e-commerce.

9.5.3.1 Continuous Reform and Innovation of the Regulatory Service System

Through continuous reform and innovation of the regulatory service system, cross-border e-commerce enterprises are promoted to build a global digital industry chain and innovation chain led by branding. Cross-border e-commerce provides important development opportunities for SME enterprises in branding operations. A large number of non-traditional brand owners are leveraging the platform economy and digital assets of cross-border e-commerce to quickly achieve their strategic branding goals. Regulation can be strengthened in the following four areas.

1. Further strengthen market regulation, unblock the institutional mechanisms that restrict the development of the digital economy and trade such as data property rights, consumer protection at the same time, innovate management system reform, deepen cooperation and exchanges in the field of e-commerce and technology, and enrich and improve the digital ecosystem.
2. Accelerate the construction of industrial support system, promote the market connection of cross-border e-commerce trade and industry, and build cross-border e-commerce industry chain with branding construction. Through the integrated advantages of the industrial chain, further consolidate and strengthen the foundation for the growth of well-known brands in China's cross-border e-commerce.
3. Promote the entry of service products such as tourism, arts, entertainment and audio-visual products into the cross-border e-commerce system and promote a greater expansion of the scope of the cross-border e-commerce sector.
4. Promote cross-border e-commerce comprehensive pilot zone and import pilot city reform, and continue to import more quality products through cross-border e-commerce, driving related industries to improve quality and efficiency, and develop a higher level of the world-oriented large market.

9.5.3.2 Seize the Opportunity of Digital Economy Development

Today, the world's trade chain is being reorganized and the digital economy is developing healthily. Cross-border e-commerce enterprises should seize this opportunity to improve the digitalization of their own enterprises and shift to more refined operations. It can also develop digital production in large quantities, promote the rapid

integration of manufacturing and service industry in the field of cross-border e-commerce, and promote the upgrading and innovation of the digital industry chain formed or promoted by cross-border e-commerce enterprises as the leader. At the same time, fine service is the core to create a comprehensive competitive advantage. Cultivate and promote new products, new models, new business models and new channels for cross-border e-commerce through the value provided by continuous innovation in products, brands, channels and services. Strengthen comprehensive macro and micro research and digital capability enhancement, and enhance industry risk prediction and dynamic adjustment capabilities. Take advantage of China's strong manufacturing industry chain and digital resources to build and improve the cross-border e-commerce industry chain, value chain and ecological chain from both the demand and supply sides.

9.5.3.3 Breakthrough Transportation and Trade Barriers

Integrate online and offline development, break through transportation and trade barriers, strengthen supply chain advantages and reduce business risks. On the one hand, continue to optimize the construction of the logistics system, actively expand new transport channels, break through logistics blockages, and build a cross-border transport system containing multiple forms and types of China-Europe trains, international maritime transport, Asia-Europe Continental Bridge, and international air transport. On the other hand, we can also explore various forms of localized operations to strengthen the supply chain and industry chain resilience and reduce operational risks. For example, in view of the lack of logistics facilities and backward payment system in Southeast Asia and Africa, we can explore the mode of building collection warehouses, overseas warehouses and payment warehouses in the form of equity cooperation with local enterprises, and for these West African wholesale centers such as Nigeria, we can explore the way of combined development of e-commerce and traditional trade. Through equity cooperation and product cooperation with local enterprises, it is conducive to improving the resilience of the localized industrial chain, solving the problems of cross-border logistics and cross-border payment, strengthening diversified international cooperation and integration, and promoting the construction of a new round of economic globalization.

9.5.3.4 Increase the Construction of Supporting Industries

In the global supply chain, China has a rich variety of goods, basically including eighty percent of the global supply chain, and due to the high cost of logistics and distribution so that many goods just stop at the national gate, although a large number of cross-border e-commerce platforms or enterprises by establishing overseas warehouses and other ways to actively respond, there is also a huge cost loss behind the establishment of overseas warehouses. It is difficult for both platforms and SMEs to strike a balance between the cost and price advantages of overseas warehouses.

In response to this point China should take corresponding measures to vigorously strengthen the maturity of cross-border logistics, cross-border payment and cross-border customs clearance and other industrial support, so as to lay the foundation stone for the development of China's cross-border e-commerce industry. In particular, it is necessary to further promote the improvement of Internet infrastructure and the construction of a global logistics network to expand the scale of transactions, so that the growth of cross-border e-commerce can promote the growth of China's foreign trade to provide new momentum.

9.5.3.5 Optimize Product Categories and Quality

In the global supply chain, Chinese export products have long been mainly produced at the low end, and a large number of cross-border e-commerce enterprises do not have their own brands, not to mention the brand effect. Faced with such a development dilemma, Chinese cross-border e-commerce enterprises should actively change their business philosophy, fully understand the consumption needs and consumption preferences of foreign consumers, design products suitable for foreign consumption, adjust the design, R&D and production methods of products, improve the added value of products through personalized design, or improve their market competitiveness by improving the practicality of products, create a brand effect, and turn the production supply chain from low-end production to brand production.

9.5.3.6 Increase Talent Training

China's cross-border e-commerce, as a rapidly growing industry in terms of transaction volume, has a large talent gap. At present, most of the cross-border e-commerce practitioners are e-commerce majors, English majors and international business majors, and there are no counterpart talents in cross-border e-commerce yet. Colleges and universities should increase the training of counterpart professionals when formulating training programs, increase the training of counterpart professional skills, and solve the shortage of talent supply. In order to meet the developmental needs of cross-border e-commerce enterprises, the government should give full play to its guiding role and introduce corresponding policies to promote the cultivation of e-commerce and English composite talents. And cross-border e-commerce enterprises should play a more subjective initiative, actively absorb English, e-commerce industry personnel and carry on targeted training to them to improve the loyalty of talent, so as to lay a good technical foundation, professional foundation for their own development.

9.6 Summary of this Chapter

Cross-border e-commerce is of great strategic importance as a technical basis for promoting economic integration and trade globalization. Cross-border e-commerce not only breaks down the barriers between countries and makes international trade go to borderless trade, but also it is causing great changes in the world economy and trade. For enterprises, the open, multi-dimensional and three-dimensional multilateral economic and trade cooperation model built by cross-border e-commerce has greatly widened the path to enter the international market and greatly promoted the optimal allocation of multilateral resources and mutual benefits among enterprises; for consumers, cross-border e-commerce makes it very easy for them to obtain information from other countries and buy goods at good prices. Under the general trend of rapid development of global e-commerce and globalization of Chinese e-commerce, China has promulgated a series of policies to support the development of domestic cross-border e-commerce industry since 2004, which has enabled China's cross-border e-commerce to maintain a steady growth momentum, and China's cross-border e-commerce industry has developed rapidly with a continuous and significant increase in the transaction scale. The world's cross-border e-commerce has also grown rapidly under the epidemic environment. Despite the many advantages and rapid development of cross-border e-commerce, the industry still has certain development and challenges that hinder and restrict the further take-off of cross-border e-commerce.

9.7 Review of Reflection Questions

1. What is cross-border e-commerce? Talk about your understanding of cross-border e-commerce.
2. Talk about the development history of cross-border e-commerce.
3. Briefly describe the classification of cross-border e-commerce import clearance mode, and analyze its advantages and disadvantages.
4. What is B2B and B2C and what is the difference between them?
5. Analyze, for example, what are the changes in cross-border e-commerce in China in recent years?
6. Taking into account the development trend of e-commerce, how should cross-border e-commerce play its advantages in the future to serve the development of China's digital economy?
7. What will be the favorable impact of "overseas warehouse" mode on cross-border e-commerce?
8. Briefly explain what are the advantages of cross-border e-commerce development in the electronic free trade zone and the comprehensive test area? And give examples to illustrate.

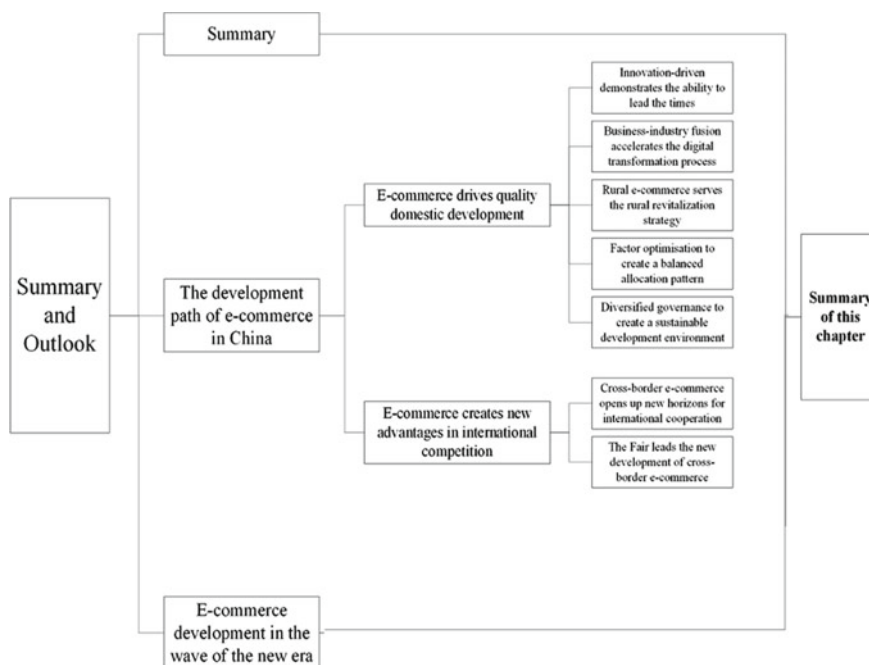
9. Briefly explain what are the advantages of cross-border e-commerce development under E-WTO system? And give examples to illustrate.
10. Briefly describe what opportunities and challenges the new crown epidemic brings to the development of cross-border e-commerce.
11. What are the current initiatives of China's cross-border e-commerce policy construction?
12. Briefly describe the cross-border e-commerce policies introduced in this book? What are the specific contents?
13. Talk about your understanding of the macro environment of cross-border e-commerce development in China.
14. Please briefly describe what are the typical markets for cross-border e-commerce outside China and talk about what future development options are available for Chinese cross-border enterprises.
15. Briefly describe the new opportunities and challenges for the development of cross-border e-commerce.

Chapter 10

Summary and Outlook



Knowledge Map of this Chapter



10.1 Summary

The year 2021 is the opening year of the implementation of the 14th Five-Year Plan and the outline of the 2035 Vision of China, and the first year of the new journey of building a comprehensive socialist modern country. During the 13th Five-Year Plan period, China's e-commerce has maintained a good momentum of development, and has become an important part of the digital economy with the largest scale of development, the fastest growth rate, the widest coverage and the most active entrepreneurship and innovation, and an important driving force for the integration of the real economy and the digital economy.

The rapid development of e-commerce has also indirectly contributed to the development of China's economy. In the process of changing the traditional mode of economic development, e-commerce has a role that cannot be replaced by other information technologies. It promotes China's traditional economic development model to the direction of effectiveness, efficiency, convenience and speed, gradually turning to the use of science and technology, big data and other new economic development model, and then e-commerce due to its convenience, efficiency, high yield and other characteristics in China's national economy to occupy the market, and then promote the steady growth of China's national economy. E-commerce in enterprise companies, domestic trade, etc. plays an important role. It is also an important tool for transmitting social information, and a new force for economic growth in China. Therefore, the development of e-commerce is of great importance to the economic development of our country, so cannot curb its development. Thus, promoting the industrialization process in China and improving the quality and efficiency of economic operation is of great practical significance for the socialist modernization of the mid-20th century.

In today's globalized economy, we must integrate e-commerce with the traditional economic model, maintaining the essence of the economy while eliminating those things that are backward and unsuitable for the information and data-based economy of today, only in this way can our economy continue to develop and surpass the existing economy under the impact of economic globalization. In the context of economic globalization, we should try to grasp and seize the opportunity to make our development faster and more stable, to develop a more long-term strategic vision, to grasp the opportunity, not to be impatient, not to be complacent, and to keep our feet on the ground in order to develop better and longer. When facing various challenges of globalization, we must be courageous and strive to overcome all kinds of challenges and difficulties, so that e-commerce can develop and grow under difficult conditions, and new experiences become more resilient and develop better under difficult conditions. In this way, we can better promote the economic development of enterprises and the growth of the national economy.

10.2 The Development Path of E-Commerce in China

E-commerce is the result of the deep integration of information technology and business activities. With scenario-based, digital and intelligent as its main characteristics and low-cost and high-efficiency as its main advantages, e-commerce has to a certain extent promoted new productivity and new development trends, thus driving the structural reform of the supply side of China's economy and the upgrading of consumption, and becoming an important support for economic growth in countries around the world. As the second largest economy in the world, China has a good foundation for development and huge room for development, and has created a road for the development of e-commerce with Chinese characteristics, providing Chinese wisdom for the development of China and the world.

10.2.1 *E-Commerce Drives Quality Domestic Development*

General Secretary Xi proposed at the National Conference on Internet Security and Informatization that we should accelerate the promotion of digital industrialization, constantly give rise to new industries, new industries and new models, and promote new development with new kinetic energy; promote the digitization of industries, use new Internet technologies and applications to transform traditional industries in an all-round, all-angle and all-chain manner; promote the deep integration of the Internet, big data, artificial intelligence and the real economy, and accelerate the manufacturing. Agriculture and service industries are digitalized, networked and intelligent. Under the new situation in the new era, e-commerce continues to stimulate vitality and power, and continues to promote high-quality domestic development.

10.2.1.1 Innovation-Driven Demonstrates the Ability to Lead the Times

Innovation is the first driving force leading development and is a strategic support for building a modern economic system. The shaping of a high-quality e-commerce industry cannot be separated from technological application innovation, business model innovation and enterprise collaborative innovation.

1. Technology application innovation

The development and evolution of e-commerce is closely related to the iterative update of technology, and it is only by profoundly grasping the change of technology application that we can promote the change of e-commerce. The current development of e-commerce is no longer limited to the simple adoption of traditional technologies such as Internet technology and information security technology, but emphasizes the promotion of 5G, big data, Internet of Things, artificial intelligence, block chain, VR, AR and other new generation information technologies for integrated innovation and

comprehensive application in the field of e-commerce to further enhance the product level and service capacity of e-commerce and improve the quality and efficiency of e-commerce development.

2. Industry model innovation

The upgraded application of new-generation information technology has provided the underlying foundation for the development of new business models in e-commerce, making the role of e-commerce in reconstructing the industrial value chain continuously enhanced. The emergence of new business models such as social e-commerce, content e-commerce, fresh food e-commerce and live-streaming e-commerce has continuously enriched the e-commerce consumption scenario, deeply explored the consumption demand, and significantly improved the accuracy of matching supply and demand. Under the epidemic, the integration of e-commerce and various fields is even ushering in big changes: firstly, digital operations have achieved rapid transformation, with telecommuting and cloud exhibitions becoming important ways of communication in commerce and trade; secondly, the application level of digital documents has been continuously improved, with electronic invoices, electronic contracts, electronic files and electronic face sheets greatly enhancing the efficiency of transaction confirmation; thirdly, digital payment research has been deeply promoted, and the digital RMB has gradually penetrated into the field of e-commerce payment, bringing about significant improvement in payment security and efficiency.

3. Collaborative innovation

Under the new situation, the development of e-commerce places more emphasis on collaboration, enhancing communication through collaboration, raising the level of enterprises through cooperation, and constantly bringing into play the supporting and guiding role of network platforms in expanding markets and improving industrial structures. Collaboration mainly includes two levels, one is enterprise collaboration, with emphasis on resource complementation and data sharing between enterprises, focusing on the orderly opening of data, channels, talents, technology and other platform resources between enterprises, strengthening the organic combination of innovation and industry chains, and promoting the integration of innovation between upstream and downstream industry chains, large and small enterprises. Second, strengthen regional collaboration, formulate regional e-commerce service strategies, promote the integration of infrastructure, service resources and project funds in the region, promote the synergistic development of the east and west, and form a regional e-commerce development ecology with dovetailing production and marketing, complementary advantages and deep synergy.

10.2.1.2 Business-Industry Fusion Accelerates the Digital Transformation Process

Business-industry integration is an important way to stimulate the product power and innovation of e-commerce, and an important way to accelerate the digitalization of industry.

1. Manufacturing intelligence

For manufacturing enterprises, their core value lies in providing customers with satisfactory services, and the application of any technology is a means around achieving this core value. At present, most of China's manufacturing enterprises are technology-driven, lacking sustainable and efficient profitability mechanisms and business model innovation. E-commerce, on the other hand, also faces new challenges in the development process: how to accurately reflect consumer demand, quickly provide products and services, and effectively connect production and marketing. In such an environment, e-commerce has shown a trend of extending to the upstream manufacturing chain, interconnecting with the industrial internet platform, collaborating and innovating, promoting the traditional manufacturing industry to "go to the cloud and use the data to empower intelligence", and building a new intelligent manufacturing model with e-commerce as the traction, i.e. based on the e-commerce platform to connect with users' individual needs, adopting personalized customization, flexible production, reverse design, direct user connection manufacturing, etc., to achieve synergistic improvement of enterprise marketing and order taking ability and collaborative manufacturing ability.

2. Supply chain digitalization

The "integration of business and production" will accelerate the digital integration of finance, logistics, storage, processing and design in the supply chain, thus forming a new model of industrial Internet and a new industry. Represented by enterprise e-commerce, it will transition from the traditional single service model to an integrated online and offline service, solving business pain points in procurement, marketing, distribution and customer service, forming a flexible supply chain business system with rapid supply chain response capability.

10.2.1.3 Rural E-Commerce Serves the Rural Revitalization Strategy

Rural revitalization is an important strategy for the country to promote the modernization of rural agriculture, and it is also the necessary way to build a moderately prosperous society and promote socialist modernization in an all-round way. With the development of e-commerce and the implementation of policies related to e-commerce in rural areas, rural e-commerce has become a new development mode that drives the integration of rural industries and promotes economic and social development, and it provides new momentum and a new carrier for the revitalization of the five levels of the countryside.

10.2.1.4 Rural E-Commerce Serves the Rural Revitalization Strategy

To achieve the goal of building a moderately prosperous society and comprehensively constructing socialist modernization is the need to make the modernization of rural agriculture a priority, while rural revitalization is a key national strategy to promote the modernization of rural agriculture. In recent years, e-commerce has driven the formulation of relevant policies from cities to rural areas. As a new economic development model, rural e-commerce has helped the integrated development of various industries in rural areas, ultimately promoting the progress of the whole society's economy, especially providing new impetus and a new carrier for the five major aspects of rural revitalization.

1. Promoting the revitalization of rural industries

The entry of e-commerce into rural areas opens up new sales channels, focuses on the selection and breeding of products with special characteristics, cultivates them into local special industries and promotes the expansion of the market scale of the original industries. These changes also indirectly improve the infrastructure of rural areas rich in products and diverse channels and increase the income of people in rural areas.

With the support of big data, rural e-commerce has forced the transformation and upgrading of traditional industries in rural areas with large-scale and standardized production, and has even created new industries as a result, while ensuring product quality. Subsequently, rural e-commerce clusters have emerged, from production to packaging, transportation and sales promotion, with various links in the entire supply chain. Rural e-commerce has gathered the resource elements needed at each end of the supply chain, achieving an efficient gathering of logistics, information flow and capital flow.

2. Promoting the revitalization of rural talents

The development of rural e-commerce has brought a large number of e-commerce talents back to rural areas, solving the dilemma of talent being a constraint to rural e-commerce. The return of talents has given the countryside a new lease of life, and the elderly and children left behind in the countryside have new opportunities for development, which is the social benefit of rural e-commerce in addition to the economic benefits it brings.

3. Promoting the revitalization of rural ecology

The entry of e-commerce into rural areas has brought new impetus to the revitalization of rural ecology. The resulting large number of Taobao villages and Taobao outlets has, to some extent, alleviated the environmental problems caused by the development of rural industries. The re-emergence of rural industry and commerce has led to a fuller use of rural land, and the associated support for e-commerce business production is available at a lower cost, promoting the green development of the rural economy.

4. Promoting the revitalization of rural culture

Rural e-commerce has further enhanced the effect of the popularity of the Internet. E-commerce has brought new culture and new ideas core concepts to rural areas, changing the backward thinking of rural people and creating new farmers nowadays, and also promoting the further upgrading of the three streams of e-commerce. At the same time, rural e-commerce has greatly promoted the construction of a harmonious rural society by driving farmers to increase their income and solving rural employment problems.

5. Promoting the revitalization of rural organizations

Grassroots organizations in the countryside lose their vitality due to the lack of fresh blood injection, but with the development and help of rural e-commerce, many young people have returned to the countryside and entered rural organizations to become rural e-commerce leaders. All these talents are important forces for the revitalization of rural organizations. In addition, the aid of science and technology has digitized and made transparent rural commerce, further upgrading the governance and management of the countryside. This is an important role that the concept of rural e-commerce plays in promoting the revitalization of rural organizations.

10.2.1.5 Factor Optimization to Create a Balanced Allocation Pattern

1. High-level use of data elements

The normal operation of e-commerce requires the assistance of data, which is a fundamental element for the further development of e-commerce and is of high value. The development of e-commerce in the new era is no longer a simple analysis of production data, sales data and user data, but a data sharing mechanism that is extended to all walks of life, all enterprises and all departments, allowing them to share data among themselves and realize the openness of data in the e-commerce industry. This has an important role to play in the enhancement of data value. At the same time, e-commerce enterprises need to continuously improve their data processing capabilities within the scope of legality and make efforts for the establishment of a data sharing system in the e-commerce sector.

2. High-quality cultivation of talent elements

The essence of e-commerce is still commerce, and commerce is ultimately a human activity. The innovation of various elements of e-commerce has put forward deeper requirements for the talent element. The traditional on-campus training method can no longer meet the requirements of the new development of e-commerce. Strengthen the five-in-one talent training model of “government, industry, learning, research and application”, encourage e-commerce platforms and e-commerce enterprises to carry out joint actions with colleges and universities, carry out all-round e-commerce training, and strengthen the construction of talent markets in various regions, cities,

states, counties, townships and villages. The new direction of talent training is to promote the construction of composite talent supply.

3. Optimizing carrier resources to a high standard

An important way to accelerate the ability of cooperation and development of enterprises concerned in the field of e-commerce is to develop e-commerce industry service carriers. With the support of a number of national policies, e-commerce demonstration bases have begun to be set up on a large scale in various regions of China. As demonstration bases are of great significance in spearheading the development and progress of small and medium-sized industrial parks, it is only by improving the public service level of demonstration bases and achieving more professional and diversified operation services that we can eventually form a carrier network covering the whole of China with e-commerce base points all over the country and promote further development of e-commerce.

10.2.1.6 Diversified Governance to Create a Sustainable Development Environment

E-commerce constantly creates new business models to adapt to environmental changes, which inevitably brings risks while bringing huge development benefits. In the face of the new problems and risks arising, deepening e-commerce governance and creating a favorable development atmosphere cannot be ignored. The development of e-commerce in China is not determined by one party, the government or the market, but is the result of the joint action of both parties. Therefore, the governance of e-commerce should be multi-party joint and multi-governance.

For market e-commerce platform operators, they should accelerate the iterative upgrading and application of digital technology, continuously improve platform rules, enhance platform autonomy, improve the security, fairness and openness of the platform, and accelerate the implementation of the network security system.

For the government, it should form a positive interaction with enterprises, strengthen supervision and guidance of the market and enterprises, use data to guarantee network security based on the development of science and technology, and establish a data property rights system to improve market norms. In the e-commerce sector, the government should establish a comprehensive set of governance standards to promote the healthy development of the e-commerce industry, protect consumer rights and interests in the transaction process, make use of credit collection systems, establish credit systems, and increase protection for both enterprises and consumers.

For e-commerce industry organizations, the organization should actively liaise with all parties to form a multi-party e-commerce governance system to create a favorable environment for the development of a digital economy.

10.2.2 E-Commerce Creates New Advantages in International Competition

10.2.2.1 Cross-Border E-Commerce Opens Up New Horizons for International Cooperation

With the advancement of Internet technology, the building of global logistics networks, the diversification of payment methods and China's consumption upgrade, the scale of China's cross-border e-commerce market has gradually expanded, more and more Chinese products have opened their doors to overseas. China is also gaining more international cooperation and mutually beneficial trade cooperation opportunities as a result. This is a new dynamic to achieve mutual promotion of the domestic and international double cycle and to promote high-quality economic development.

China has always been a strong supporter of promoting a high level of cross-border e-commerce development, continuing to promulgate favorable policies, encouraging e-commerce platform companies to operate globally, making continuous improvements in all aspects of e-commerce, upgrading infrastructure and optimizing the layout of the industry, which has greatly enhanced the security and convenience of trade with various countries. At the same time, China has also introduced various policies to stimulate the development of cross-border e-commerce supporting service enterprises and has stepped up efforts to build cross-border e-commerce comprehensive pilot zones, seeking to take Chinese products and brands out of China to the world and to digitize the global industrial chain and supply chain. In addition, China is actively exploring innovation in the whole process of cross-border e-commerce transactions, promoting the formation of international trade rules adapted to the development of cross-border e-commerce and building an international framework. China has combined the Belt and Road Initiative and the development of cross-border e-commerce to promote the development of Silk Road e-commerce, and has now established bilateral e-commerce cooperation mechanisms with 22 countries on five continents, taking the path of cross-border e-commerce development with Chinese characteristics (Table 10.1).

10.2.2.2 The Fair Leads the New Development of Cross-Border E-Commerce

China International Import Expo (CIIE), referred to as "Import Expo", "Into the Expo", etc., is organized by the Ministry of Commerce of the People's Republic of China and the Shanghai Municipal People's Government, and hosted by the China International Import Expo Bureau and the National Convention and Exhibition Center (Shanghai). It is the first national exhibition in the world with the theme of import. The China International Import Expo plays a pivotal role in the process of China's opening up to the outside world and is an important initiative by China to open its

Table 10.1 History of the 132 cross-border e-commerce pilot zones approved nationwide

Time	Number	City
March 2015	1	Hangzhou
January 2016	12	Ningbo, Tianjin, Shanghai, Chongqing, Hefei, Zhengzhou, Guangzhou Chengdu, Dalian, Qingdao, Shenzhen, Suzhou
July 2018	22	Beijing, Hohhot, Shenyang, Changchun, Harbin Nanjing, Nanchang, Wuhan, Changsha, Nanning, Haikou Guiyang, Kunming, Xi'an, Lanzhou, Xiamen, Tangshan Wuxi, Weihai, Zhuhai, Dongguan, Yiwu
December 2019	24	Shijiazhuang, Taiyuan, Chifeng, Fushun, Zhangchun Suifenhe, Xuzhou, Nantong, Wenzhou, Shaoxing, Wuhu Fuzhou, Quanzhou, Ganzhou, Jinan, Yantai, Luoyang, Huangshi, Yueyang, Shantou Huangshi, Yueyang, Shantou, Foshan, Luzhou, Haidong, Yinchuan
April 2020	46	Xiongan New Area, Datong, Manzhouli, Yingkou, Panjin, Jilin Heihe, Changzhou, Lianyungang, Huai'an, Yancheng, Suqian Huzhou, Jiaxing, Quzhou, Taizhou, Lishui, Anqing, Zhangzhou, Putian, Longyan, Jiujiang, Dongying, Weifang, Linyi, Nanyang, Yichang, Xiangtan, Chenzhou, Meizhou, Huizhou, Zhongshan, Jiangmen Huizhou, Zhongshan, Jiangmen, Zhanjiang, Maoming, Zhaoqing Chongzuo, Sanya, Deyang, Mianyang, Zunyi Dehong Dai Jingpo Autonomous Prefecture, Yan'an City, Tianshui City, Xining City, Urumqi City

market to the world. From the perspective of e-commerce, the Fair has had a huge impact on e-commerce, especially cross-border e-commerce.

Firstly, the Fair has facilitated the transformation, upgrading and reshaping of the cross-border e-commerce industry; enterprises, brands and commodities from all over the world have expanded into the huge Chinese market through the Fair, providing rich resources and development momentum for China's cross-border e-commerce. Chinese cross-border e-commerce, which is in a new period of transition, has taken this opportunity to begin to refine, brand, localize and diversify its development and gradually move towards the center of the global e-commerce stage. Secondly, the Fair has built a cross-border e-commerce exhibition and marketing platform and ecological system; unlike the traditional gathering of the world's commodities for exhibition and sale and supply and demand cooperation, the Fair provides integrated cross-border e-commerce comprehensive services including summit forums, facilitated customs clearance and comprehensive financial services, and has built the world's first cross-border e-commerce exhibition and marketing platform and ecological system with a complete system, complete functions and perfect services. Thirdly, the Fair promotes cross-border e-commerce to meet diversified consumption needs; as consumer demand expands and upgrades, consumers begin to shift their consumption targets from local branded goods to world branded goods, paying more attention to the quality of goods and consumption experience, and import

consumption tends to normalize; the Fair communicates between cross-border e-commerce platforms and consumption, satisfies diversified consumer needs, and expands the overseas products. The introduction of overseas products and brands is conducive to the transformation, upgrading, change and restructuring of China's domestic industries.

10.3 E-Commerce Development in the Wave of the New Era

In recent years, the world's major economic powers have been facing increasing downward pressure due to factors such as increased international trade frictions and geopolitical risks. This trend has become even more pronounced especially after 2019, when GDP growth rates of major economic powers have fallen sharply.

China's outstanding e-commerce performance during the epidemic has enabled global business entities to find new targets to restore economic momentum. As Jingdong's e-commerce practice in China. This is reflected not only in the enormous value of the efficient operation of supply chains, technology and logistics networks, but also in the rapid realization of all factors of production. The "multiplier effect" will profoundly change the way and mode of world trade, driving the world into a new era of trade.

The e-commerce "backlash" during the epidemic allowed global business entities to find new targets for economic recovery and catapulted the world into a new era of commerce. However, even if it no longer meets the needs of the new era of commerce, the traditional rules of trade continue.

The key to driving growth in consumer demand in 2020 remains in China, and if you want to appeal to the Chinese market, you don't have to bypass e-commerce. Many international brands are experiencing a 'wave of closures' in the wake of the new pneumonia epidemic: luxury goods are undoubtedly one of the sectors most affected by the epidemic. As the epidemic begins to slow down in the country, large luxury companies naturally have high hopes that the Chinese market will gradually warm up.

However, for the top luxury brands, which rely more on their shops, it is clearly not realistic to expand their offline shops quickly. Moreover, unlike the structure of luxury consumers abroad, domestic luxury consumers are younger and have long been accustomed to socializing and shopping via the internet. Therefore, choosing a platform with quality consumers and strong logistics capabilities is undoubtedly a shortcut for international luxury brands to expand into the Chinese market.

In an increasingly open and inclusive business environment, many overseas brands are eager to experiment with the vast Chinese market and e-commerce has become an important platform for overseas brands to enter the Chinese market. E-commerce platforms provide an efficient and low-risk channel for foreign brands. At the same time, e-commerce platforms can also meet the personalized and diversified consumption needs of domestic consumers through the large-scale introduction of foreign brands and categories.

Industry insiders said that the impact of the new pneumonia epidemic on international trade is obvious, but it is easy to see that the epidemic under the e-commerce “fight back” for international trade has brought a new dawn, so that global business entities to find a new focus to restore economic development. In this era of unprecedented connectivity, the epidemic has limited travel and cut off connectivity, but e-commerce platforms have played an important role with their strong logistics chains.

Promoting the development of e-commerce, especially cross-border trade, is not only the general trend to transform and improve traditional foreign trade, but also an inevitable step to actively respond to the epidemic and effectively cope with the downward pressure of foreign trade growth. After the epidemic, global e-commerce will tend to normalize. The reason for this is that business e-commerce not only ensures the virtualization of the transaction process, effectively reducing the frequency of offline contact between the two parties to the transaction, but also expands the inclusive range of transaction targets, enabling SMEs that are unable to carry out activities based on traditional business models to participate in international trade through digital platforms and thus successfully overcome the crisis. More importantly, in the context of economic integration and trade globalization, e-commerce has not only overcome barriers between countries and shifted international trade to borderless trade, but has also triggered changes in world trade.

The development of traditional trade from regional to global has been driven primarily by transport innovations and the revolution in communication technology. With the rapid development of Internet technology, world trade has changed in terms of commercial presence, business management and trade patterns. The most obvious role of e-commerce platforms is to bring businesses and consumers closer together. As information about raw materials becomes more symmetrical, consumers can see products from different countries on the Internet, and businesses can quickly learn about user preferences and other feedback through the platform. In short, e-commerce is making the world smaller and the marketplace bigger. It has always been able to connect many of the world’s fragmented and very irregular markets into one big marketplace that everyone can access to trade.

Indeed, the increasing globalization and virtualization of the international division of labor, driven by e-commerce, has pushed the global market to optimize the allocation of resources under its auspices and achieve a Pareto lift. This new change has triggered a change in international business models and facilitated a transformation of international business patterns. Industrial products, which previously dominated international trade, have been replaced by information products.

But this does not mean that there is a shortcut to the new global trading system. The traditional rules of trade continue, even though it no longer meets the needs of the new commercial era. In addition, cross-border trade generates a large number of fragmented and individual orders, with a trade path that is very different from the traditional “container order”. However, new regulatory models have not yet been established by governments and many rules, such as relevant tax and technical standards, have not yet been defined.

10.4 Summary of this Chapter

This chapter has illustrated that e-commerce has a significant role to play in China's economic development, to make it an important link between China's industrialized economy and information technology, and thus promote the development of China's industrialization and improve the quality and efficiency of national economic operation. As the second largest economy in the world, China has a good foundation and great potential for the development of e-commerce, opening up a path of e-commerce development with Chinese characteristics, providing Chinese wisdom for the development of e-commerce in China and even in the world, and also having great significance for the realization of socialist modernization in the mid-20th century and the Chinese dream of achieving the great rejuvenation of the Chinese nation.