

# Study On The Evolutionary Path Of Ecosystem For High-Quality Development Of Cross-Border E-Commerce Empowered By Digital Economy--A Single Case Study Based On Grounded Theory

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**Abstract:** The digital economy has gradually become a new driving force for the high-quality development of the service industry under the penetration of information technology development. Based on the research on the digital economy enabling high-quality development of service industry at home and abroad, this paper further explores the inner mechanism of the digital economy enabling high-quality development of cross-border e-commerce with specific cases and concludes that the digital economy can enable cross-border e-commerce channel innovation, precise matching of supply and demand, resource sharing to achieve a multiplier effect of economic benefits, and transformation of development mode to achieve sustainable development. However, due to factors such as digital infrastructure construction in the service industry, professional digital talents, geographical disparity, digital technology utilization rate, and inadequate market and system related to the digital economy, it is difficult to bring the advantages of its role mechanism into play. Therefore, in order to realize the high-quality development of cross-border e-commerce empowered by the digital economy, it is necessary to establish a good market environment as well as system, improve digital infrastructure, actively cultivate digital talents, narrow regional differences, as well as strengthen the support and protection of digital industry by laws and regulations.

**Keywords:** Digital economy; Empowerment; Cross-border e-commerce; Quality development; Ecosystem.

## I. Introduction

The concept of "digital economy" was

first introduced in 1994. The digital economy is a new economic form that is different from

the agricultural and industrial economies and enables the development of inter-industry integration through the sharing of data resources, and the free flow of resource factors out of the constraints of time and space. Guan Huijuan et al. argue that the digital economy includes digital equipment manufacturing, digital information transmission, digital technology services, digital content and media, Internet applications, and related services. Shen et al. (2016) summarize the digital economy as a shift from a manufacturing-based economy to a service-based economy, specifically defined as a measure of the relative ratio of labor, capital, and technological innovation. The digital economy is the trend of future development, adhering to the main line of supply-side structural reform and accelerating the conversion of new dynamic energy for economic development. The development of a new generation of information and communication technologies represented by big data, blockchain, 5G, etc. promotes the deep integration of the digital economy and socio-economic activities and is also an inevitable requirement to comply with the global digital transformation.

China's digital economy will reach 39.2 trillion yuan in 2020, accounting for 38.6% of GDP, an increase of 9.5% compared to 2019, and a small increase in the ratio of the digital economy to GDP. It can be seen that with the rapid development of the digital economy in recent years, the boundaries of the factors have expanded, and data has become a new factor of the production function, which works together with

resources, labor, capital, and other factors of production to develop the production of industries (HUI and YANG, 2022) and improve the level of contribution to the economy.

The outbreak and spread of the new coronavirus pneumonia epidemic make the role of the digital economy more and more prominent. The application of digital economy gradually penetrates into all walks of life, and industry is the main battlefield of using digital economy, which can provide power for the transformation and upgrading of the industry to achieve high-quality development. As an important strategic pillar industry, the industry has an important leading position in the national economic system. Therefore, it is important to study the digital economy to empower industries to achieve high-quality development.

In summary, there is still much room for research on the evolutionary mechanism of digital economy-enabled cross-border e-commerce ecosystems in the context of shocks. Based on this, this paper firstly interprets the research on the digital economy to enrich the research digital economy and provide new ideas and path options for the construction of the ecosystem of high-quality development of cross-border e-commerce. On the basis of this paper, we analyze and research specific cases using rooting theory. We identify the specific paths of the digital economy to empower the cross-border e-commerce ecosystem and provide theoretical support and guidance direction for the future high-quality sustainable development of cross-border e-commerce in the digital economy.

## II. Literature Review

### 2.1 The development status of the digital economy

Scholars at home and abroad have focused on three levels of research on how the digital economy affects industrial development: the first level is that the digital economy has become a new driving force for industrial development and promotes industrial transformation and upgrading. The digital economy is closely related to the level of China's industrial structure, and the transformation of the industrial structure is essentially the reallocation of resource factors among industries. As a new economic form, the digital economy has become an important driving force to promote industrial quality, efficiency, and power change. Traditional industries with the advantages of the digital economy can reconstruct industrial competitiveness, reshape the industrial ecology, promote the automation of the overall process of research and development, production, sales, and organization of industrial industries, and ultimately realize the transformation and upgrading of the industrial structure rang. Chi believes that the digital economy uses digital technology as key support to digitally transform traditional industries in an all-round, all-angle, and all-chain way (Qian et al.,2021;Qi & Zhu,2021;Guo & Du,2019;Hu,2019). It promotes industrial structural change" and structural productivity improvement through diffusion, spillover, and penetration effects.<sup>8</sup> Scholars at home and abroad also use different panel data for

empirical analysis and conclude that the development and application of the digital economy have a significant positive impact on industrial transformation and upgrading. The second dimension is that the digital economy optimizes the allocation of resources, reduces the mismatch of resource factors, and improves the total factor productivity of industries. With the development of a new generation of communication technologies represented by big data, artificial intelligence, 5G, blockchain, etc., scholars have gradually shifted their focus to the digital economy as a new engine of economic growth, and found that the use of digitalization not only significantly improves the efficiency of capital accumulation" and human capital efficiency, by increasing the degree of digital empowerment of people (Hjort & Poulsen,2019) to promote total factor productivity The use of digitalization has been found to significantly improve not only the efficiency of capital accumulation" and human capital efficienc to increase the degree of digital empowerment of people(Qiu & Zhou,2019) to promote the increase of total factor productivity, but also to increase the economic growth rate. Domestic scholars have also verified the impact of the digital economy on total factor productivity from different dimensions using provincial and municipal panel data, and the research results show that the digital economy can significantly improve total factor productivity (Yang & Jiang,2021). Technological means can promote the optimal allocation of resource factors and the improvement of total factor efficiency, and in

the digital economy environment, industries use the development of emerging information technology to promote the effective connection between the industrial chain and the innovation chain and promote the overall improvement of industrial factor use efficiency (Li & Han,2021). Yu confirmed that the digital economy affects the input ratio of production factors and can reduce factor mismatch and improve factor allocation efficiency (Yu & Wu,2019). The third dimension is that the digital economy can save industrial production costs. The development of digital technology and information becomes a key factor, and the development of digital technology weakens the phenomenon of information asymmetry, and traditional theory suggests that transaction costs always exist under the influence of information asymmetry, while blockchain technology in the digital economy makes it possible to eliminate transaction costs through smart contract reconstruction, which reduces the components that constitute production costs to a certain extent (Chen et al.,2022). JONES and TONETT(2020) believe that because digital information has non-competitive characteristics not only brings about economies of scale, but also realizes the value-added of digital information itself instead of weakening or disappearing after use, and also has the advantage of significantly reducing search costs, replication costs, transportation costs, tracking costs, and verification costs(Golddfarb & Tucker,2019 ), the impact is changing the way and path of socio-economic development. The analysis of big

data optimizes the allocation of resources, improves organizational efficiency, and leads to a significant reduction in input costs, thus increasing economic benefits (Batmaz & Koksals ,2020). Moreover, Autor et al. (2020) and others have confirmed that companies that use the digital economy benefit more than those that do not.

The existing domestic and international literature has explored how the digital economy affects industrial development and promoted the idea that the digital economy empowers manufacturing

The existing literature at home and abroad has explored how the digital economy affects industrial development and promoted research on the basic logic and theoretical connotation of the digital economy enabling high-quality development of the manufacturing industry. However, with the continuous development of emerging information and communication technologies, the

digital economy continues to extend to the industrial field, and the inner mechanism of the digital economy enabling high-quality industrial development is not yet clear. Accordingly, this paper analyzes the intrinsic mechanism of the digital economy enabling the high-quality development of the industry to clarify the logical relationship between them.

On this basis, the pain points of digital economy-enabled industrial high-quality development are explored, and the realization path of digital economy-enabled industrial high-quality development is proposed to promote the development of the digital economy.

Based on this, the pain points of digital economy-enabled industrial high-quality development are discussed, and the path of digital economy-enabled industrial high-quality development is proposed to promote industrial high-quality development. As the main force to promote industrialization and socialist modernization, the industry is the main body of the national economy and the foundation of the country. Faced with the impact of the new coronavirus pneumonia epidemic, China's development is in the midst of the greatest change of the century.

In the face of the impact of the new coronavirus pneumonia epidemic, China's development is in a critical period of unprecedented changes in the past hundred years.

The research on promoting high-quality industrial development is of great significance for the great revival of the Chinese nation.

## 2.2 Ecosystem theory

An "ecosystem" is defined in ecology as a system formed by the interaction of a community of organisms with the abiotic components of its environment (Odum & Eugene P, 1971). A large number of scholars have used the theory of ecology to metaphorically describe organizational problems as ecological problems, bringing a broader perspective to the field of management research: Moore (1993) first introduced the concept of "business ecosystem" and divided its life cycle into four stages: emergence, expansion, leadership, and death or self-renewal. Later, in 2006, Ander pioneered the development of

the "innovation ecosystem" study, arguing that any firm should "evolve symbiotically" with the ecosystem in which it operates, rather than just competing or cooperating, eventually forming multilateral, heterogeneous alliances with interactive needs. alliance structures built between heterogeneous participants with interactive needs (Wang, Weinan, et al., 2019). Most scholars analyze the relationship between organizational groups and their evolution by drawing on the ecological niche theory of biological populations, and use the similarity between human social organizations and biological ecosystems as a metaphor for the dynamics of system structure and adaptability to the environment (Zhang et al., 2020), further introducing the concept of "ecosystem" to the social sciences. (Zhang et al., 2020), further introduced the concept of "ecosystem" into the social sciences. At the same time, the term "ecosphere" appears close to the term "ecosystem" in the literature: the term "ecosphere" originates from the field of ecology, which encompasses organisms and organismal Moore was one of the first researchers to introduce the concept of ecosphere into the field of technological innovation, defining it as a loosely coupled network that emphasizes the central role of firms and research institutions, and the importance of the innovation environment. He defines the innovation ecosystem as a loosely coupled network that emphasizes the central role of producers such as firms and research institutions and focuses more on the dynamic bridging and dynamic presentation of innovation agents and elements (Moore et al., 2012). As a complex adaptive ecosystem,

the innovation ecosystem has different evolutionary processes in different stages for the effective use of heterogeneous resources and good adaptation to environmental complexity and is an open nonlinear entity. Later on, some scholars also studied the business alliance model of an "agricultural logistics ecosystem" composed of individuals or organizations with economic and trade connections based on business system theory, which is different from the ecosystem in the natural world that simply emphasizes the strongest and the weakest, and focuses more on the cooperation or win-win symbiosis between systems, and builds a more advanced development model through the mutual coordination of all subsystems (Shu). A more advanced development model can be built through the mutual coordination of all subsystems (Shuhui et al., 2020). Other scholars put forward the concept of the creative ecosystem in the study of the pooling and interactive development of innovative creative resources, presenting the iterative system of evolution from lower to higher order within the ecosystem formed by different categories of resources according to the amount of information they contain (Zhang Yue et al., 2020). In the field of poverty alleviation, scholars have also mentioned the "poverty alleviation ecosystem": Tang Wei (2018) conducted an in-depth study on the mutually beneficial symbiosis mechanism of the postal e-commerce poverty alleviation ecosystem from three levels: postal e-commerce business, business linkage, and assistance from multiple subjects, providing a theoretical basis for regional precision

poverty alleviation. Zhang (2020) has also proposed building a precise poverty alleviation ecosystem to achieve a win-win sharing of poverty alleviation policies, research results, data information, and service models. However, these scholars did not provide a complete definition of the "poverty alleviation ecosystem", and the scope is still vague.

Since the concept of "system" exists all the time, as long as the cross-border e-commerce platform is in operation, it must be in the "ecosystem". Therefore, the "ecosystem" can only show a single mechanism, and cannot reflect its systemic stages. Based on this, this paper proposes the theoretical concept of "ecosystem", studies the coordination and cooperation between the "ecosystem" in each stage, and portrays it through the concept of "ecosystem". The concept of "ecosphere" is used to portray the characteristics of the poverty alleviation ecosystem, such as its good circulation and self-regulation system.

So far, the research on cross-border e-commerce platform ecosystems is still blank in the academic field, and the concept of "ecosystem" is not clearly defined, so there is an urgent need to summarize the constituent elements of the ecosystem comprehensively, find the regulation mechanism among the systems, establish a complete model of the cross-border e-commerce platform ecosystem, and study its growth stages and evolution mechanism. stages and evolutionary mechanisms.

### **III. Research Methodology and Case Selection**

### 3.1 Research Methodology

#### 3.1.1 Data sources and collection methods

The data collection methods of this study mainly include formal and informal interviews, secondary data collection, on-site observation, etc. The main sources of information in this paper include (1) paper and electronic files. The main sources include (1) Paper and electronic files, such as meeting minutes, annual company work summaries, employee handbooks, company promotional materials, media reports, and information and literature provided by management. (2) Participant observation. The main ones are internship in the company, participation in company meetings and employee activities online and offline, etc.(3) Formal and informal interviews. There are mainly group discussion styles, in-depth interviews, impromptu interviews, etc.(4) Other informal information acquisition. Such as email, observation, etc.

The primary data information in this paper mainly comes from the authors' interviews, which are divided into three stages. The first stage is based on the research thesis, experimental interviews with the human resources and administrative departments about topics such as learning, knowledge, and people, etc. After collating the collected information, it was found that the case companies are extremely worthy of study in terms of organizational learning evolution mechanisms. The second stage was to conduct in-depth interviews with senior personnel about the collected issues and to map the development history of the company together with the personnel concerned. The

third stage was to send back the information to the interviewees and verify the information collected. The descriptive statistics of the interviewees during the research are shown in Table 2.

Because the interviewed subjects have subjective initiative and the studied subjects have risky behaviors such as not avoiding falsehood and deliberate modification, the authenticity of the data of the research subjects and the reliability of the research cannot be guaranteed, therefore, another data coding information in this paper comes from secondary data collection to obtain data. By using multi-level and multi-source data collection methods, the data is collected in multiple directions, which helps to conduct a 360° comprehensive analysis of the enterprise, and the data are compared with each other to form a comprehensive evidence chain to ensure the reliability and straightforwardness of the research topic and enhance the reliability of the research.

#### 3.2.2 Data coding and analysis

In this paper, the data collected were coded openly, spindle coded, and selectively coded in each growth stage of the case companies to extract the elements of the organizational learning process and analyze the interrelationship among the elements. More than 6,500 pieces of primary textual data were collected, and the evidence chain was sorted out based on the logic of motive, behavior, and result. Then, the primary data were categorized and analyzed by the growth stage of the enterprises, and more than 760 pieces of data were coded.

The basic steps of coding:

First, a double-blind approach was adopted to initially conceptualize the data, and the different development stages were coded, labeled, and conceptually simplified by identifying the main periods and key events according to the motives, behaviors, and outcomes, respectively. The issues and phenomena with the same or close meaning of data information formulation were grouped under a unified concept, and the number of entries was noted (the coding process is a huge workload project and is not listed in this paper due to the limitation of article length).

Next, subcategories. According to the different development stages of enterprises, "motivation" is categorized into a part according to external environmental stimulation or internal growth pressure, and "behavior" is categorized according to the process of organizational learning, ways, and key influencing factors. The "results" are grouped according to the results of the company's growth, and the concepts of the same genus are grouped into corresponding sub-categories.

Again, the main categories. The internal attributes of the sub-categories are compared and studied, and the concepts are grouped into corresponding master categories according to their similarity and relevance.

Finally, the main paradigm is constructed. Analyze the interrelationships among the main categories, discover the core categories and refine the storyline, and analyze the interrelationships among the categories to construct the transformation line and form the theoretical model.

### 3.2 Case selection

This study adopts a purposive sampling approach by comparing the typical representatives of current mainstream digital collection platform projects in China and selecting one of the most representative projects as a single case study. The case selection follows the criteria of typicality, overall linkage, and completeness of case information.

As a transformation of e-commerce enterprises in the digital economy, Cloud9 stands out relatively among many cases. As a clothing trendy product, Cloud9 is exported to Southeast Asian markets and has a fixed customer base. However, with the outbreak of the epidemic, Cloud9's production and sales faced a crisis and digital transformation was imminent. Therefore Cloud9 team has made a useful attempt in the digital field. The research team of this paper has interfaced with the Cloud9 team to observe and collect first-hand information as an independent observer in the DAO community built by Cloud9. In addition to this, the team also conducted semi-structured interviews with core members of the Cloud9 team and core members of the community. We also collected a lot of secondary information about the development of the digital economy on the Internet.

## IV. Case studies and propositions

4.1 Brand from traditional market to cross-border e-commerce stage  
As a trendy apparel brand, Cloud9 has gained the love of many young people because of its unique design. However, due to the low entry barrier of the



apparel industry, many designers created their trendy brands, and there were more homogeneous products in the market, Cloud9's sales output received a serious impact. cloud9 team began to consider moving to cross-border e-commerce. To further save costs, Cloud9 chose to move its production to Cambodia, where labor costs are lower and made Southeast Asia its main sales market. cloud9's transition paid off, and soon became a popular brand in Southeast Asia.

The rise of cross-border e-commerce has given Cloud9 more opportunities, but Cloud9 is also facing some problems. Although the state has supported cross-border e-commerce and introduced corresponding policies to pave the way for the development of cross-border e-commerce, and given certain preferences and support to enterprises, coupled with the improvement of the external environment, apparel enterprises have many favorable conditions in the development process, but the challenges faced in the transformation are also not negligible. The dilemma faced by garment enterprises in the context of cross-border e-commerce is mainly in 3 aspects: first, logistics and transportation; second, payment; third, integrity. Because cross-border e-commerce is not only a domestic transaction but also involves trade between different countries, in terms of transportation, the cost is higher, coupled with higher tariffs and lower security in terms of national imports and exports, these are real problems in front of the garment export enterprises. Especially in terms of payment, different countries use different currencies and face the problem of

currency conversion when making payments, and the exchange rate of currencies changing at any time, plus the cross-border financial transactions themselves have certain security risks, making the interests of both buyers and sellers may be threatened. In addition, in some garment export enterprises in China, when carrying out cross-border e-commerce trade, the added value of the product itself is low, and the construction of the supply chain is relatively lacking, which cannot accurately and quickly respond to these problems, resulting in more difficulties faced by enterprises in the process of export trade, which restricts the development of garment export enterprises.

In addition, in the cross-border e-commerce platform, the low price and homogenization of clothing products are very serious. Most enterprises also use the production mode of OEM processing and imitation processing, mainly relying on low-cost low-price products to obtain market survival space, weak independent research and development capabilities, low investment in research and development, and insufficient design professionals, resulting in product technology content is not high, low value-added, lack of core competitiveness and independent intellectual property rights, coupled with the lack of unified guidance of the cluster, the tendency of product homogenization competition is very serious. This not only brings excessive competition among cluster enterprises but also greatly restricts the transformation and upgrading of enterprises and healthy and sustainable development. Segmentation of the market is not enough, the head of the market

competition is the tail of the blue ocean obvious long tail theory points out that in any category, there is a "head" and "longtail". The "head" is the most popular part of the product, the number is not much, but the sales volume is very large "longtail" refers to each product demand and sales are very small but can be extended to near infinity. Unlike traditional industries, in the cross-border e-commerce apparel category, although the sales of each style in the longtail section are small, the total sales and profits are comparable to those of the regular and bursting apparel models because of the longtail. cloud9 is not only facing the above problems. With the global outbreak of Newcastle Pneumonia in early 2020, Cloud9 had to face another transformation. And the digitalization mentioned above gives Cloud9 a good idea.

Based on the previous review and the analysis of the above discussion, this paper proposes the following two propositions.

**Proposition 1:** Target market shift is a concrete manifestation of the self-regulation mechanism when e-commerce brands face difficulties. However, this requires that the brand has core values and wide recognition.

**Proposition 2:** In the digital economy, traditional cross-border e-commerce brands are endowed with more self-development capabilities. In particular, the unique feature of digital technology enables products that previously had homogeneity to have a unique identity, thus enhancing their value.

#### 4.2 Digital Economy Empowerment Stage

The coding and case analysis shows that the formation of the ecosystem for high-quality development of cross-border e-commerce

under the empowerment of the digital economy is a gradual evolutionary process, which is constantly adjusted and improved in concrete practice. The core of the ecosystem of high-quality development of cross-border e-commerce under the empowerment of the digital economy is the various participating subjects in the system, among which consumers are the top priority in the whole system. From the perspective of the formation of multiple participating subjects, it actually contains the process of ecosystem formation. Empowered by the digital economy, Cloud9's transformation is accurate and rapid when cross-border e-commerce is facing difficulties. cloud9 quickly establishes an identity-based image in the consumer group by designing an IP image, and the new image quickly attracts a group of supporters with a cute and trendy appearance. the supporters and the team together establish a decentralized community organization, which includes members from all walks of life The community members include practitioners from all walks of life. The practitioners break down barriers in a decentralized environment and provide a lot of constructive meaning to the development of Cloud9.

The participants in the ecosystem of high-quality development of cross-border e-commerce under the empowerment of the digital economy include government departments, cross-border e-commerce platforms, NFT platforms, consumers, IP identifiers, potential consumers, and master creative teams. These participating subjects are also one of the constituents of the ecosystem of high-quality development of

cross-border e-commerce under the empowerment of the digital economy (see Table 1 on the next page). Each participating subject has the same value orientation and goal consistency, i.e., the common value system of promoting the high-quality development of cross-border e-commerce under the empowerment of the digital economy. The common value system can highly unite different groups in various fields, continuously expand a synergistic and consistent identity for high-quality development on the basis of full respect for their differences, form a shared language and vision of intolerance of diversity, and form a shared value system with the IP image and the value it represents as the core. On the basis of the effective operation of the cross-border e-commerce high-quality development ecosystem empowered by the digital economy, the construction of identity

equalization, operational activities, and behavioral norms within the decentralized community is completed. The equalized identity label promotes the expectation and sense of belonging of the participating subjects to the common cognition, which enables the members of the community to form the driving force and creativity to promote the development of the brand and converge into a positive feedback mechanism to promote the overall synergy, and smoothly enter the path of high-quality development of cross-border e-commerce under the empowerment of digital economy.

The components of the ecosystem for high-quality development of cross-border e-commerce under the empowerment of the digital economy include participating subjects, shared elements, relevant policy support, and other support systems (as shown in Table 1).

**Table 1 Components of the ecosystem for high-quality development of cross-border e-commerce empowered by the digital economy**

Components	Participating Subjects	Government-related departments, cross-border e-commerce platforms, NFT platforms, consumers, IP identifiers, potential consumers and master creative teams
	Shared Elements	Resources, social capital, human capital, knowledge, learning mechanisms
	Support System	Policy support, community governance, social protection, inclusive growth, service platforms

Among the constituent elements, shared elements include resources, social capital, human capital, knowledge, and learning mechanisms. From the perspective of economics, these elements can be

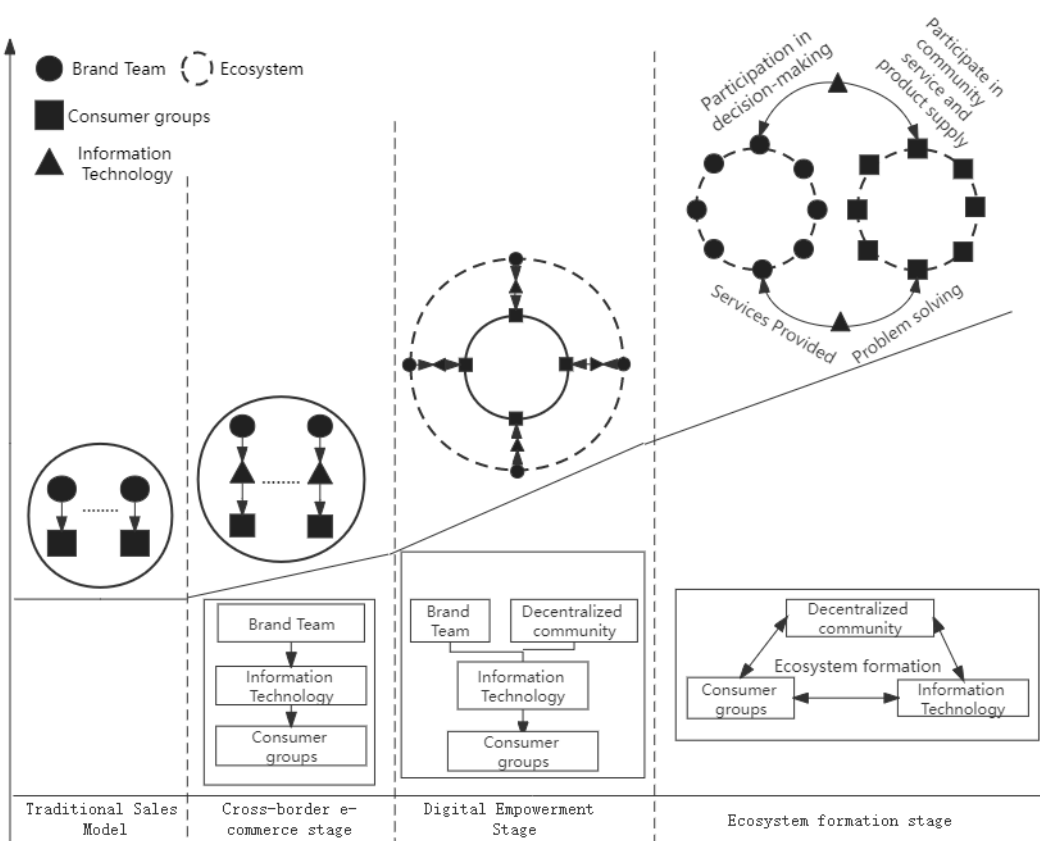
collectively referred to as input elements. Under the concept of shared development, we refer to these elements as "shared elements". This is because the quality development ecosystem of cross-border e-

commerce empowered by the digital economy needs to be built by everyone, collaborate with each other, and develop symbiotically and cooperatively. Through this interactive relationship, a common identity is established and resources are no longer scarce things available only to certain groups. Ordinary consumers, IP identifiers, and potential consumers can break the limits in the decentralized community with their own resources, thus reaching the ideal level of accumulating resources and enhancing their own value. Therefore, these elements are shared. From the perspective of evolution, the ecosystem of high-quality development of cross-border e-commerce empowered by the digital economy will not be static or always in a static state. In the evolutionary process from its formation to maturity, as the construction of common identity is completed and the equalization of identity is formed, the greater the role played by the shared elements, the greater the promotion effect on consumers, IP identifiers, and potential consumers, the greater their enthusiasm and creativity to participate in the construction of the cross-border e-commerce

high-quality development ecosystem, and the more the cross-border e-commerce high-quality development ecosystem empowered by the digital economy the more mature the cross-border e-commerce quality development ecosystem enabled by the digital economy is. The formation path of cross-border e-commerce high-quality development ecosystem empowered by digital economy is shown in Figure 1.

Based on the previous review and the analysis of the above discussion, this paper proposes the following two propositions.

**Proposition 3:** Digital economy empowering cross-border e-commerce is actually reflected in resource integration, value addition and sustainable development. Cross-border e-commerce thus forms an ecosystem with self-healing, self-development and self-adaptation.



**Figure 1 The formation path of cross-border e-commerce high-quality development ecosystem empowered by digital economy**

**V. Conclusions and Recommendations**

Based on the case study, the paper draws the following conclusions: Target market shift is a concrete manifestation of the self-regulation mechanism when e-commerce brands face difficulties. However, this requires that the brand has core values and wide recognition. In the digital economy, traditional cross-border e-commerce brands are endowed with more self-development capabilities. In particular, the unique feature of digital technology enables products that previously had homogeneity to have a unique identity, thus enhancing their value. Digital economy empowering cross-border e-commerce is actually reflected in resource

integration, value addition and sustainable development. Cross-border e-commerce thus forms an ecosystem with self-healing, self-development and self-adaptation.

Based on the conclusions of this paper and combined with the current situation of the digital economy, this paper puts forward the following policy recommendations.

First, strengthen the construction of digital infrastructure for cross-border e-commerce. In the context of globalization, seizing the opportunity of digitalization of cross-border e-commerce can gain the high ground of cross-border e-commerce development, and digital infrastructure construction is the foundation and

prerequisite for the development of a digital economy, as well as an important platform for the high-quality development of digital economy-enabled manufacturing industry, which provides an important guarantee for realizing the high-quality development of digital economy-enabled manufacturing industry. First, the relevant departments need to introduce relevant policies to encourage and guide social funds to invest in the construction of digital infrastructure for cross-border e-commerce and establish a perfect infrastructure system. Secondly, the infrastructure of traditional e-commerce platforms should be transformed and upgraded. As information and communication technology changes frequently, digital infrastructure should also be constantly developed and perfected, in line with the development trend. The construction of digital infrastructure can facilitate the free flow of production factors, accelerate the optimization and upgrading of cross-border e-commerce structure and realize the supply of products. The construction of digital infrastructure is conducive to promoting the free flow of production factors, accelerating the optimization and upgrading of cross-border e-commerce structure, and realizing the accurate matching of product supply and demand. Because the construction of digital infrastructure requires a large amount of investment in the early stage and has a long return period, the government needs to provide cross-border e-commerce enterprises with financing channels for construction funds, tax subsidies, and other policies to encourage manufacturing enterprises to

expand infrastructure construction, to comprehensively consolidate the construction of digital infrastructure, to accelerate the coverage of digital infrastructure to the manufacturing industry, to promote digital infrastructure to scientific, networked and We will strengthen the data sharing within the industry by relying on digital infrastructure, and play the role of the digital economy in empowering cross-border e-commerce.

Second, strengthen the training of digital talents in the manufacturing industry. The cultivation of digital talents is the endogenous driving force for the transformation, optimization, and upgrading of the manufacturing industry structure, and it is also the top priority for high-quality development. Strengthening the training of professional talents in the digital economy is conducive to applying the digital economy to the manufacturing industry, giving new momentum to the development of the manufacturing industry, activating the vitality of the manufacturing industry, releasing the potential of the digital economy, and promoting the manufacturing industry to move forward to the goal of high-quality development. From the national level, the government should adhere to the strategy of talent development, take the demand of the advanced manufacturing industry as the wind back, pay attention to the cultivation of high-level and high-quality NPCs required by enterprises, increase the financial investment in the cultivation of professional digital talents in educational institutions and scientific research institutions, and also create a favorable development environment

for NPCs to reserve enough human capital for the future high-quality development of China's manufacturing industry, to The NPC should also create a favorable development environment for the NPC to reserve enough human capital for the future high-quality development of China's manufacturing industry, to support the transformation of "Made in China" into "Created in China".

Third, to narrow the gap between the development of the digital economy in the region. The gap in the development of the digital economy exists largely because of the large gap in the level of economic development between regions, and the level of economic development affects the number of available funds, which also affects the degree of digital investment of manufacturing enterprises. To narrow the digital divide of the digital economy between regions, we must narrow the economic development gap between regions and balance the level of economic development. From the national level, first of all, optimize the policy environment for the development of manufacturing enterprises, government policies should be tilted to less developed areas, providing financial support and preferential policy assistance; secondly, from the digital economy to empower the high-quality development of manufacturing pain points, it is known that the digital divide is partly due to the existence of infrastructure gaps, the government should also strengthen the coverage of digital infrastructure in less developed areas to reverse The problem of insufficient digital infrastructure construction. From the enterprise level, the

synergy of the East, Central and West regions is needed. First, the manufacturing enterprises in the eastern region should continue to strengthen the digital economy to lead the development of a high-quality manufacturing industry, fully develop the digital economy, play the role of radiation diffusion, pull the economic development of the surrounding areas, and then drive the national economy to progress together.

Fourth, improve the efficiency of the use of digital technology. At present, China's economy has reached a critical stage of industrial transformation and upgrading, and cross-border e-commerce enterprises should review the situation, seize the opportunity, actively absorb and learn from the innovations of emerging digital technologies, and accelerate the pace of digital transformation. Through the "Internet +" and other advanced information and communication technology, promote the digitization of each link, drive the digitization of upstream and downstream enterprises in the industry to improve the utilization of digital technology in manufacturing, fully release the digital dividend, and give full play to the advantages of the digital platform to realize the digital economy to empower the high-quality development of manufacturing. To solve the problem of the low utilization rate of digital technology, the government can also draw on the experience of developed countries to encourage manufacturing enterprises to improve the efficiency of the use of the digital economy. To promote the high-quality development of the manufacturing industry, it is not only necessary to take advantage of

digitalization, accelerate the pace of digital society construction, create a good digital development environment, and fit the goal of building digital China, but also to rely on the development strategy of the national digital economy, establish the top-level design of digital economy to empower the high-quality development of manufacturing industry from the national level, coordinate the relationship among government, market, manufacturing industry and manufacturing-related enterprises, and form a digital economy to empower the high-quality development of manufacturing industry. We should coordinate the relationship between the government, market, manufacturing industry, and manufacturing-related enterprises, and form the synergy of the digital economy to enable the high-quality development of the manufacturing industry.

Fifth, improve the legal system of data protection. Data has gradually become the core element to promote the development of the digital economy, and at this stage, a complete legal system has not been formed for the protection of enterprise data, which is still in the exploration stage. The state should not only intervene in the theft of data, but also gradually establish a comprehensive data security protection system, use legal means to protect the legitimate rights and interests of enterprises, stimulate the confidence of enterprises to use the digital economy to bring advantages, and create a good environment for the development of the industry's digital economy.

## References

1. ACEMOGLU D, RESTREPO P (2020). Robots and jobs: evidence from US labor markets. *Journal of Political Economy*, (6):2188-2244
2. ACEMOGLU D, RESTREPO P (2019). Automation and new tasks: how technology displaces and reinstates labor. *Journal of Economic Perspectives*, (3)323-30
3. Adner R (2006). Match your innovation strategy to your innovation ecosystem. *Harvard Business Review*, 84(4): 98.
4. DDORN D, KATZ L.F, et al (2021). The fall of the labor share and the rise of superstar firms. *The Quarterly Journal of Economics*, 35(2):645-709
5. BATMAZIKOKSAL G (2013). Overview of knowledge discovery in databases process and data mining for surveillance technologies and EWS. *Bioinformatics*:42-71.
7. Chen Xiaohong, Li Yang, Song Lijie, et al (2022). Theoretical system of digital economy and research outlook. *Management World*, 38(2):208-224.
8. HJORT I, POULSEN I (2019). The arrival of fast internet and employment in Africa. *American Economic Review*, 109(3):1032-1079.
9. HU J (2019). A study on the impact of regional Internet development level on manufacturing upgrading. *Soft Science*, 33(5)6-10.
10. Guo, M.C., Du, Chuanzhong,



- D(2019). Mechanisms and effects of ICT on improving the quality of China's economic growth. *Statistical Research*, 36(3):3-16.
11. JONES CI, TONETTI C (2020). Non-Rivalry and the economics of data. *American Economic Review*, 110(9):2819-2858
12. Jiaqi, Y., & Teo, B. S. X. (2022). Tourist Destination Brand Loyalty and Experiential Marketing: A Case of Langkawi Island, Malaysia. *Journal of Positive School Psychology*, 6(3), 5636-5647.
13. Li Y J, Han P (2021). Mechanisms and paths of high-quality development of manufacturing industry in the digital economy. *Macroeconomic management*, (5):36-45.
14. MOORE J F (1993). Predators and prey: a new ecology of competition. *Harvard Business Review*, 71(3):75-86.
15. Odum, Eugene P (1971). *Fundamentals of Ecology* (third ed.). New York: Saunders. ISBN 978-0-534.
16. QIU Zixun, ZHOU Yahong (2021). Digital economy development and regional total factor productivity: An analysis based on national-level big data comprehensive experimental zone analysis. *Financial Research*, 47(7):4-17.
17. Qian Yewen, Huang Qinghua, Zhou Mi (2021). The connotation, logic and ways of digital economy to promote the transformation and upgrading of traditional manufacturing industry. *Innovation Science and Technology*, (3):10-17.
18. Qi, I.D., Chu, XI (2021). Digital economy development, economic structure transformation and crossing the middle-income trap. *Finance and Economics Research*, 47(7):18-32
19. Tang Wei (2019). Research on the precise poverty alleviation ecosystem of Jiangsu postal electric business. *China Economic and Trade Journal*, (12):91-92.
20. PAIOLA M, GEBAUER H (2020). Internet of things technologies, digital servitization and business model innovation in BtoB manufacturing firms. *Industrial Marketing Management*, 89:245-264.
21. Shu Hui, Hu Yi (2020). Analysis of synergistic influence factors of agricultural logistics ecosystem based on rooting theory. *China circulation economy*, (1):30-41.
22. Wang WN, Wu XNT, Mei L (2019). Innovation ecosystem: A systematic review of a contextual perspective. *Scientific Research Management*, 40(09):25-36.
23. Wang, Y., Deng, J., Teo, B. S.-X., & Jaharadak, A. A. (2022). Health poverty, educational capital and industrial integration of rural households: An empirical study based on micro-data. *International Journal of Health Sciences*, 6(3), 1452–1467.  
<https://doi.org/10.53730/ijhs.v6n3.1>

[3031](#)

24. Wang, Y., Li, H., Teo, B. S. X., & Jaharadak, A. A. (2022). Correlation Analysis between Residents' Income Satisfaction and Mental Health Based on Big Data. *Occupational Therapy International*, 2022.
25. Yang, Huimei, Jiang, Lu (2021). Digital economy, spatial effects and total factor productivity. *Statistical Research*, 38(4):3-15.
26. Yu W. T., Wu S. W.(2019). Internet platform economy and industry productivity change: an empirical study based on the third economic census data. *Finance and Economics Science*,(8):55-68.
27. Zhang Yi,Liu Renhuai,Chen Haiquan (2020). Influencing factors of platform leadership in business ecosystem-an exploratory study based on rooting theory. *Nankai Management Review*,23(03):28-38.
28. Zhang Yue, Shen Lei, Mu Yu, Zhao Yuanjun(2020). Research on value co-creation of multiple subjects in creative ecosystem--a case study based on Ningbo Hefeng Creative Plaza. *Research and Development Management*,32(03):165-178.
29. Zhang Yue,Shen Lei,Mu Yu,Zhao Yuanjun (2020). Research on value co-creation of multiple subjects in creative ecosystem--a case study based on Ningbo Hefeng Creative Plaza. *Research and Development Management*,32(03):165-178.
30. Zhang, Haibo, Sun, Jianhui (2020). Micro governance, internal and external synergy and the construction of poverty alleviation ecosystem-implications of theoretical ideas of the 2019 Nobel Prize in Economics for financial poverty alleviation.*Jilin Finance Research*,(07):53-57.
31. Zhang, S., Li, W., Teo, B. S. X., & Othman, J. (2022). A Sub-Sector Study On Financialization And Technological Innovation Capability Of Chinese Listed Companies. *Journal of Positive School Psychology*, 6(7), 1901-1921.