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Analysis in-Depth of the Factors that Impact the Development of E-Commerce in Underdeveloped Areas from the Perspective of Operating Process

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Abstract: The booming e-commerce has played an important role in the growth of regional economy and the e-commerce of underdeveloped regions has been developing rapidly as well. However, there is a large gap between underdeveloped and developed regions due to the limitation of economic foundation, geographical condition and other factors. The research of effects on the e-commerce development of underdeveloped regions played an important role in the promotion of e-commerce. Based on the perspective of operating process, starting from the indicator of information flow, capital flow and logistics, this article established the indicator system of effects on e-commerce in underdeveloped region. After collecting data by questionnaire survey, getting the right of each index by AHP and comparing the differences of important indicators between the e-commerce developments in the eastern and western important indicators, summarize the factors which affect the e-commerce development of underdeveloped regions, proposes to suggestions such as strengthen the guide of government functions and so on.

Keywords: E-commerce; Operating process; Underdeveloped areas; AHP

1. INTRODUCTION

Electronic commerce as an important way of business information affects every aspect of human society deeply. As it involves many of the social economy of traditional industries and emerging industries, electronic commerce has formed a large e-commerce ecosystem around the way of electronic trading, which profoundly affects the operation of the social economy and organization structure works. Up to now, the electronic commerce has been developing for recent 20 years in China. Due to the different developmental levels, the propulsion of e-commerce also shows different hierarchies. In the coastal developed areas, the electronic commerce has stronger vitality and steps into rapid growth stage. However, the electronic commerce develops slowly in the underdeveloped region because of natural environment, cultural environment and the underdeveloped market economy.

E-commerce transaction mode no longer needs a physical market to trade face to face. From aspects of business flow perspective, the information release, the trade negotiation between the sellers and the buyers, the capital flow and completed transaction, this process needs information flow, capital flow and logistics to realize. Therefore, the government needs to put forward the corresponding policy to promote the development of underdeveloped regions and to make e-commerce develop rapidly and healthily because business flow perspective is the most important factor affecting e-commerce significantly in the underdeveloped areas.

2. LITERATURE REVIEW

The development of electronic commerce got rapid development in the 1990 s around the world. Around 1995, scholars like Cockburn and Wilson, Dou, Fuller and Jenkins get into the electronic commerce field successively. Later, Murphy, Blessinger, Ali Sanayei, Reza Shafe 'ei, Riemenschneider, Heng Wang and

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Jinchang Hou also studied electronic commerce influence factors for acting e-commerce in the enterprises and mainly due to enterprise organization, the development of the Internet and enterprise information integration, environmental and industry factors such as industry characteristics, national policy, the degree of competition, consumer trust, etc.^[1-3]

From the point of domestic literature, Jin Zhanming found that the mainly restricting factors is the lack of corresponding technical talent refer to the reason analysis of limiting development of the whole e-commerce industry^[4]. Liu Lijun etc were put forward that logistics system constraints on the development of e-commerce more obviously^[5-6]. Shao Binggu focused on consumer trust in electronic commerce factors^[7].

The exploration of e-commerce restriction factors in underdeveloped focused on qualitative analysis. Li Jianchuan thought that mainly factors affect imperfection of logistics system and low credit degree of network^[8]. Tan Chunni thought that economy was not developed and consumption level was low. At the same time, urban residents concepts backward which not favorable to the development of electronic commerce^[9]. Mary thought that the problem of e-commerce in western region are the backward network infrastructure and enterprise management^[10]. Chen Zhijun focus on the analysis of low awareness of e-commerce among urban residents, the related legal system was not perfect^[11].

In the literature which study e-commerce by application of analytic hierarchy process, Zhou Tao determined the evaluation index of B2C by using analytic hierarchy process (ahp), based on two level 2 indexes of usefulness and ease of use on e-commerce site^[12]. Wang Shanjun divided the risk of e-commerce into three factors that were information flows, logistics, and capital flows in business security risk assessment model. And he came up with a safety risk assessment model^[13]. MoHaiXi with analytic hierarchy process (ahp) on the influencing factors of logistics distribution center selection process, got the value of each alternative point selection model was obtained by constraint equations^[14].

According to review the literatures above, we knew that the literature of Quantitative analysis of the electronic commerce development in underdeveloped areas was relatively few, and that the Analytic hierarchy process (ahp) was more widely used as a kind of effective tools to explore the influence factors. So this article embarks from the perspective of business flow, using the analytic hierarchy process (ahp) to explore the impact factors on e-commerce development in underdeveloped areas and put forward to Suggestions to guide practice.

3. E-COMMERCE - "FOUR FLOWS" UNITY

E-commerce based on information technology along with the transmission of information, the circulation of capitals and transfer of goods' space and time to finish the assignment of rights to the product finally. It formed the separation and unit of information flow, capital flow, logistics and commerce flow in the electronic commerce. The Figure 1 shows the business Architecture.

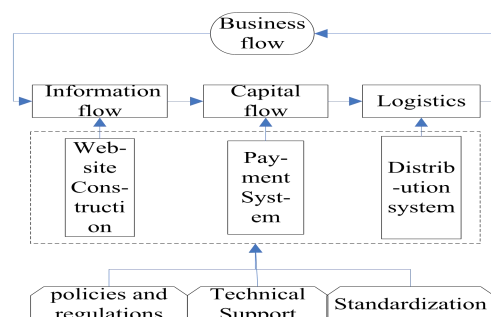


Figure 1. Overall Architecture of E-commerce

Although electronic commerce transaction is the combination of four flows, commerce flow is above another aspects, which always reflects in the whole transaction. From the perspective of operating process in e-commerce transactions, the exploration emphasis of affecting e-commerce development in the underdeveloped

region can reflect the operation of commerce flow and dig out basis affective elements by focus on studying information flow, capital flow and logistics, which finally get to know the elements affecting electronic commerce in underdeveloped regions. Electronic commerce transaction process shows in figure 2.

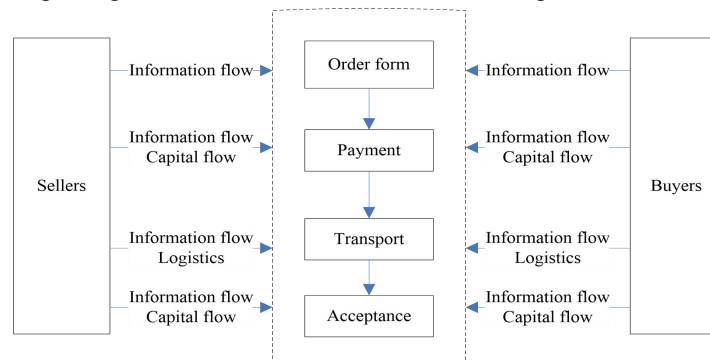


Figure 2. E-commerce Transaction Process

3.1 Information flow of operating processes perspective

Under the circumstance of electronic commerce, the flow of information accompanies the whole process of e-commerce transactions. Before the buyers make the order form, the sellers release information to contact the buyers. In the payment link, buyers need to confirm the payment amount and other information. In the process of transportation, buyers can query the goods' trace according to the website information. In the acceptance process, buyers will confirm according to your own satisfaction for receiving and evaluate the transactions. Information flow, therefore, as an important link connects buyers and sellers. It is in a higher position to control the whole process of commodity circulation in the e-commerce transactions and records the whole process of business activities.

Because poor education in the underdeveloped areas, plain recognition about e-commerce, the structured knowledge differences compared with developed regions lead to that people's recognition ability and analysis ability is weak in the underdeveloped region. As a result, the flow of information's transmission is particularly important in e-commerce transactions in underdeveloped areas. Researching perspective of business flow's authenticity, reliability and other indicators has an important impact on e-commerce development in underdeveloped areas and has a high academic value.

3.2 Capital flow operating processes perspective

In e-commerce transaction link, capital flow generally starts from buyers confirm receipt of the order link, the sellers offer a variety of payment means for buyers to choose. Now, most buyers choose the third payment companies for payment because of relatively high security. Using this payment, buyers can put money into the trusted third payment companies that both the sellers and the buyers can trust, and then the third payment companies inform the sellers that the payment has been remitted to their accounts. At this time, the sellers can deliver the goods. Until the buyers sign the delivery receipt, they will inform the third payment company to pay for. Of course, in addition to the flow of capital, the buyers, sellers, banks as well as third-party payment companies settle accounts. In the whole process of e-commerce transactions, money is the key factor that involves the interests of buyers and sellers. As a result, whether the money can flow successful in both buyers and sellers' trading decides the success or failure of e-commerce transactions.

As people have weak economic foundations and low per capita disposable incomes in underdeveloped regions, consumers attach the importance to the flow of capitals. And e-commerce realizes capital flow through virtual trading pattern such as electronic money and the net bank. This capital flow has a great risk differing from the traditional trade mode. Therefore, whether the e-commerce transactions are safe and convenient for people in underdeveloped areas decides these people whether to choose the e-commerce transactions

3.3 Logistics business flow perspective

Logistics achieved that the entity flow physically from suppliers to demanders in the process of e-commerce transactions, including transportation, distribution, storage, packaging, loading and unloading, circulation processing, logistics information processing and other basic activities. In the present e-commerce transactions, the logistics will choose the third logistics distribution generally. Starting from deliver the goods, buyers and sellers can go through the logistics website providing information to query the transportation of goods and supervise it. From the point of the whole operating process, logistics began in the end of the trading process, but it is essential link to achieve tangible commodity trading successfully. The bearing capacity of the logistics and service efficiency are directly related to the effect of the transaction between the sellers and the buyers.

People begin to pay attention to the logistics industry in recent years in underdeveloped areas, and it is at a preliminary stage of development. Compared with developed areas, coverage of logistics network, logistics personnel employed skills and so on will have a great progress, but the e-commerce transactions force the business to separate. The buyers must want to enjoy the value of goods in time after the deal, which requires the logistics enterprises to overcome the difficulties of the objective factors such as poor infrastructure in underdeveloped regions to get the service timely and efficiently.

4. EVALUATION INDEX SYSTEM

Measure the development of e-commerce needs to establish an integrated, comprehensive index, this paper explores the impact factors of e-commerce in underdeveloped region from the perspective of above operating process. Through questionnaires for information flow, capital flow and logistics of the three aspects of development indicators weight calculation, more scientific analysis of the proportion of under-developed areas of e-business impact of each factor. Obtain the relevant data through the streets of Guiyang questionnaire. Survey is set to 15-65 year-old people, in order to ensure effectiveness, respondents were randomly selected through their work covers a wide range of characteristics, education levels vary, the use of e-commerce also vary, with some samples representative.

4.1 Data collection

The 200 questionnaires distributed, 134 valid questionnaires were recovered, efficiency reached 67%. The results showed that the age of the study sample 17-48 years old, 52.2% were female, 47.8% were male; 90.7% of the population have had e-commerce transactions; average number of e-commerce transactions was 5.7 times / month; survey of 82.1% have a college education.

In order to effectively measure the impact factors of e-commerce development in underdeveloped areas, set primary targets for information flow, capital flow and logistics from the perspective of business flow, and further to set 11 secondary indicators for the impact factors of three flows. Evaluation system shown in Figure 3.

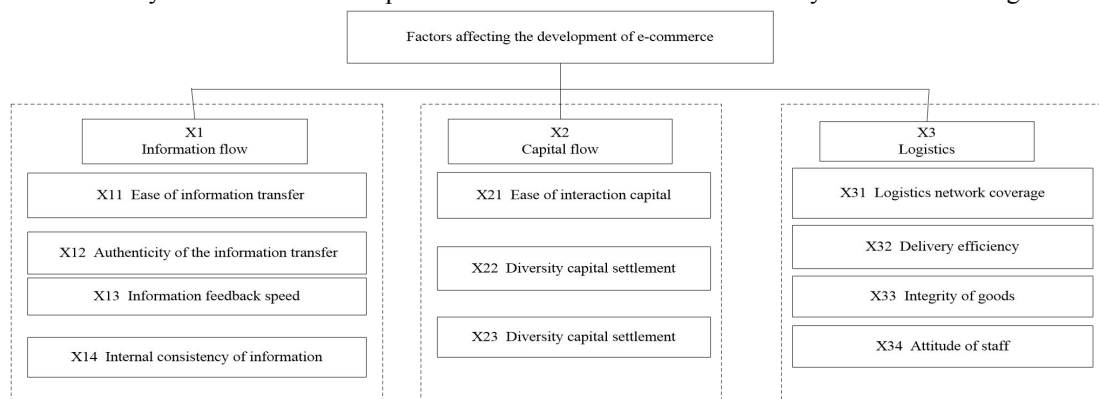


Figure 3. The impact of e-commerce development indicators underdeveloped regions

4.2 Analytical hierarchy process

Analytical Hierarchy Process was proposed by a famous American tactician Saat in 1973, it mainly decomposed relevant elements of the decision-making problem into goals, guidelines, programs and other levels. It builds a hierarchy model after the deep analysis of the complex nature of the decision problem, the factors affecting their intrinsic relationship.

4.2.1 The establishment of index inverse matrix comparison

Through each one of the various indicators of importance compared with each other to establish an inverse matrix. X_{ij} represents the matrix layer with respect to the index, X_i and X_j relative importance. General use 1, 2, 3, 4... 9 and they said the reciprocal of importance. Specific meaning are shown in table 1.

Table 1. Table 1-9 scale and meaning

scale	1	3	5	7	9	2,4,6,8
Description of X_i and X_j	X_i and X_j are equally important	X_i slightly more important than X_j	X_i is more important than X_j	X_i is more important than the X_j	X_i extreme important than X_j	X_i and X_j between the importance of the above

4.2.2 The method of determining the weights

a. The judgment matrix column vector normalization: $\tilde{A}_{ij} = \left(\frac{a_{ij}}{\sum_{i=1}^n a_{ij}} \right)$;

b. The \tilde{A}_{ij} obtained by summing the line: $\tilde{W} = \left(\frac{\sum_{j=1}^n a_{1j}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij}}, \frac{\sum_{j=1}^n a_{2j}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij}}, \dots, \frac{\sum_{j=1}^n a_{nj}}{\sum_{i=1}^n \sum_{j=1}^n a_{ij}} \right)^T$;

c. After \tilde{W} normalized vector was sort: $W = (w_1, w_1, \dots, w_n)^T$;

d. Largest eigenvalue: $\lambda = \frac{1}{n} \sum_{i=1}^n \frac{(AW)_i}{w_i}$;

e. Conformance testing: $CI = \frac{\lambda_{max} - n}{n - 1}, CR = \frac{CI}{RI}$.

4.3 Establishment of judgment matrix

According to the survey results, the percentage of the results were compared, comparison matrix is constructed information flow, capital flow, logistics and their respective sub-indices. In the sub-index information flow comparison matrixes for example.

Table 2. Sub-index of information flow comparison matrix

Index	X11	X12	X13	X14	W1	Consistency test
X11	1	1/8	1/2	1/5	0.055	CR=0.015<0. 1
X12	8	1	7	6	0.650	
X13	2	1/7	1	1/3	0.089	
X14	5	1/6	3	1	0.206	

Table 3. Levels of total ranking and Consistency test

	X1	X2	X3	Each sub-index relative to the overall goal of weight right and sequence	Consistency test
	0.240	0.623	0.137		
X11	0.055			0.0132 (10)	CR=0.0522<0.1
X12	0.650			0.1560 (2)	
X13	0.089			0.0214 (8)	
X14	0.206			0.0494 (6)	
X21		0.083		0.0517 (5)	
X22		0.193		0.1202 (3)	
X23		0.0723		0.4504 (1)	
X31			0.108	0.0148 (9)	
X32			0.267	0.0368 (7)	
X33			0.563	0.0771 (4)	
X34			0.062	0.0085 (11)	

According to results, level indicators, the impact rate of capital flows which up to 0.623 is the biggest one in underdeveloped which proved that people in e-commerce transactions concern about liquidity issue most. For analysis of secondary indicators, in the sub-indicators of the flow of information, people concerned about the authenticity of the information transmission most with a weight of 0.1560, indicating that the people can't totally accept the virtuality of e-commerce transactions and still contain the worry of difference between information transmission and actual data. Capital flows in the sub-indexes, security has become the most concerned indicators among e-commerce transactions crowd reaching 0.4504, which represents the people's concerns are focused on the capitals' flow security in e-commerce transmission and remain worry about the virtuality and security of the money in e-commerce model.; logistics in the sub-indexes, people are more concerned about the integrity of the product, with a weight of 0.0771, that shows people may have the experience of damaged goods in the e-commerce transactions, therefore, become a more important indicator. But overall, there is no profound understanding of logistics development and it became the smallest impact factors in underdeveloped areas.

5. COMPARISON OF E-COMMERCE DEVELOPMENT IN THE EASTERN AND WESTERN

Based on the above analysis of the results obtained the most important indicators of each information flow, capital flow and logistics were authenticity of information transmission, security of capital flow and goods integrity. Due to the impact of these three indicators are core indicators of e-commerce development, e-commerce development through the eastern and western score in these three indicators measured, scored between 1-10 points, the higher the score, the better the development of indicators which can compare the development of e-commerce east and west, and the gap in the development on these three indicators. E-commerce development in eastern and western survey results are shown in Table 4, sub-index score results are shown in Table 5.

Table 4. E-commerce development in eastern and western survey results

	Excellent	Good	Qualified	Failure
Developed eastern region	15.8%	59.4%	18.8%	6.0%
Underdeveloped western regions	3.0%	16.8%	42.6%	37.6%

Table 5. Sub-regional commerce development index score findings east and west

	The authenticity of the information transfer	Capital flows security	integrity of goods
Developed eastern region	7.139	7.277	7.832
Underdeveloped western regions	5.881	5.937	6.703

From the overall development of the state and the sub-index score results, showing that there is a big gap between the underdeveloped western region development of electronic commerce and the eastern region.

5.1 Authenticity of information transfer

Information flow throughout all aspects of e-commerce operating processes. Thus, the flow of information in the operating process is critical in every aspect. In the evaluation system of the flow of information, the most important is the authenticity of the information transmitted. In the sub-index score, the average score was 7.139 in the eastern region, with an average score of 5.881 in the western region. Score difference about 1.25 points. The data suggest that e-commerce transactions are common in the process of information transmission distortion, the distortion caused by both subjective reasons and objective reasons.

(1) Maturity differences of industrial development. As the comprehensive strength of eastern region is strong, a high degree of homogeneity of the product, forming a pattern of relatively transparent market information, the business costs, and profit was essentially flat, losing low-cost advantage. In this case, the e-commerce through word of mouth marketing to promote profit point rise, the real transfer of information so obtained is consistent with the physical description of the consumer is certainly an excellent way of word of mouth marketing; In contrast, in the underdeveloped western regions, scattered industry, higher cost of goods, in order to win the hearts and minds of consumers, it is possible to use the sales price leadership strategy does not match the description of goods, resulting in the western area of e-commerce in the information delivery authenticity score lower.

(2) Degree of enterprise information construction is not balanced. In the eastern region, due to the economic base, high degree of information construction, business center with high security systems, information systems are less likely to be tampered with third parties; While underdeveloped western regions, economic backwardness, information construction in the early stages, there may be loopholes in the system, which gives a malicious third party tampering, fabricating information to create the possibility, subject to third-party businesses may therefore publish false in their own e-commerce platform information, misleading consumers, resulting in the transmission of information distortion.

5.2 Capital flows security

Capital flow is late period of operating process, although it does not appear in every aspect, as the most important indicator in the whole evaluation system, it affects the e-commerce transaction effect directly. In contrast to Capital flows of the security score, the average score was 7.277 in eastern region, with an average score of 5.937 in the western region. Score difference is 1.34 points. Security score of capital flows differences is caused multifactor, mainly reflected in the following aspects:

(1) Differences in diversity of transactions. To ensure the safety of e-commerce transactions, in the eastern region, a series of financial institutions have introduced policies related transactions diversity. For example, in Shanghai, it has remitted the world, quick money and many other well-known third-party payment companies and 28 to provide online payment business banking financial institutions. Due to the presence of third-party payment companies, e-commerce transactions capital flows safety be guaranteed, effectively prevent rejection of non-payment and other conditions. These innovative services for the development of electronic commerce have played a positive role in promoting. In the underdeveloped regions, the lack of new financial institutions, e-commerce transactions capital flows relatively simple way, there are greater financial transaction network security risks.

(2) Degree of perfection of laws and regulations. E-commerce is a relatively late start traditional transactions, e-commerce related legal provisions before 1995 basically blank. In recent years, the eastern regions have been established in line with local conditions related to e-commerce laws and regulations, such as Shanghai issued a "digital certificate management approach", Guangdong promulgated the "Guangdong

Province Electronic Transactions Ordinance", Beijing issued a "Beijing Administration for Industry and Commerce online Business Bureau filed notice ". Currently underdeveloped western regions in the area of e-commerce transactions on the norms of behavior basically no laws, so people exist on underdeveloped regions capital flows concerns in security.

5.3 Integrity of the product

Logistics in the current indicator system did not cause people's attention, but it directly related to the results of e-commerce transactions as an integral part of the business flow. In the logistics system, people are more concerned about the integrity of the product, thus comparing the indicators of the development of the east and west, the average score was 7.832 eastern regions, with an average score of 6.703 in the western region. Score difference is 1.13 points, relatively speaking, this gap is the smallest, through empirical investigation in Taobao integrity of fragile goods that, in the eastern region of fragile items intact rate reached 99% in the western region was 98.4 intact %. Through data analysis, there is minor difference in good condition of fragile good between east and western regions, and the reason for this difference lies in the eastern and western regions of the first logistics transport differences due to the economically developed eastern region, on the part of the precious fragile Delivery can be by air transport, while the western region of the aviation network intensive far lower than the eastern region, the use of rail and road transport and distribution, relatively poor road conditions, increasing the risk of damage to goods on the road; Secondly, since the eastern and western regions logistics company for practitioners different levels of training, in the final distribution sectors, due to the underdeveloped West Regions of logistics personnel lack of professional knowledge, damage caused by improper operation of the product.

6. POLICE AND RECOMMENDATIONS

Differences between eastern and western regions according to e-commerce development, e-commerce development can be seen in underdeveloped areas of influence factors is complex. Underdeveloped areas of e-commerce in order to make a healthy operating environment to achieve rapid development for the current problems suggestions

6.1 Information flow

The flow of information throughout the entire aspects of e-commerce transactions consistently, the information transmission not only needs to be real and effective, but also need to protect information from being modified third party. Therefore, we need to strengthen the infrastructure and cultivating talent.

(1) Strengthen infrastructure construction. In modern society, the better economy develops, the higher requirement of infrastructure, perfect infrastructure has a huge boost to accelerate the socio-economic activities, promote the evolution of the spatial distribution of the industry. Underdeveloped regions need to accelerate the penetration and utilization of network resources while reducing network using standard tariff.

(2) The introduction of the compound talents training. Starved underdeveloped areas of e-commerce talent, in order to develop e-commerce, establish a sound mechanism for talented people is the key. On the one hand focus on training in the areas of e-commerce, information technology, marketing of compound talents, other developed regions to attract talent through salary, benefits and other factors participate in the underdeveloped areas of e-commerce in the building.

6.2 Flow of capitals

Capital flows as the most important factors of developing e-commerce currently, need to strengthen the smooth flow of capitals from the government and security guidance, and other aspects of development approaches.

(1) Create a multi-channel secure payment. Relying on existing commercial banks and other online

payment platform, on the basis of security to innovative mobile payment, mobile payment, popularize the use of electronic means of payment. In underdeveloped regions, according to local conditions to launch the region's residents to accept the payment, a gradual approach to guide people to accept electronic payments.

(2) Establish a sound legal system. E-commerce transaction involved in many procedures and wide major body, no matter the operation and registration of e-commerce business tax registration, certification of trading contracts, or the protection of privacy, product quality assurance and after-sales service and intellectual property rights many aspects, we need to introduce laws and regulations for the efficient operation of e-commerce escort.

6.3 Logistics

Logistics as a business stream to achieve the unity of commercial property sectors is the guarantee to protect smooth e-commerce transactions. Therefore, the government should strengthen the construction of the logistics aspects of the transportation network and the logistics personnel training.

(1) Strengthen transport network construction. In modern society, the role of logistics will become more prominent with the continuous development of electronic commerce. Future logistics carrier will fully rely on rail, road and air transport. But normally underdeveloped region are in outback areas, the density of the transportation network is low and the transport of goods is inconvenient. Therefore, accelerate the construction of the airport, enhanced density of railways, highways and other transportation networks; lay the foundation for the next stage of development.

(2) Standardize logistics industry. Government actively guide, construct logistics park in better basic condition, share each infrastructure resource, save investment cost effectively, form a strong industrial chain; Meanwhile, need to do standard training about the dress, operation and attitude of logistics person, which can not only improve the skills of logistics professionals, can also promote the vigorous development of underdeveloped areas throughout the logistics industry.

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