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International Economics and Business

GRADUATION THESIS

on

Current state and development of international logistics

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ASSIGNMENT
FOR THE GRADUATION THESIS OF

Master's degree student Wang Huimin, group 22ЭЭБма1, full-time mode of study

1 The topic of the graduation thesis: "Current state and development of international logistics"

was approved by the university order
dated «__» _____ 20__ no. _____

2 The deadline for the Master's degree student to complete the graduation thesis is 11.06.2024.

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

4 The list of issues to be studied includes overview of international logistics; problems existing in international trade logistics; suggestions and countermeasures to promote development of international logistics.

5 The list of visuals contains tables and figures.

6 The date of setting the assignment is 28.11.2023.

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(signature) (full name)

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

Schedule for completing the graduation thesis

№ п/п	Content of the thesis	Deadline for completion	Due date, signature of the academic adviser
First year of study			
1	Substantiating of the research topic and methodology, subject and object of research	1.09.2022 – 31.10.2022	
2	Framing the scientific concept of research	1.11.2022 – 18.12.2022	
3	Collection of scientific literature for the thesis	19.12.2022 – 15.01.2023	
4	Substantiating the relevance, concept, and novelty of the research	16.01.2023 – 19.02.2023	
5	Framing of a detailed plan and layout of the research	20.02.2023 – 12.03.2023	
6	Studying new literature sources within the topic of the thesis	13.03.2023 – 26.03.2023	
7	Conducting theoretical research within the first chapter of the thesis	27.03.2023 – 30.04.2023	
8	Preparing the first chapter of the thesis	1.05.2023 – 30.06.2023	
Second year of study			
9	Conducting analytical research within the second chapter of the thesis	1.09.2023 – 22.10.2023	
10	Preparing the second chapter of the thesis	23.10.2023 – 24.12.2023	
11	Conducting analytical research within the third chapter of the thesis	25.12.2023 – 25.02.2024	
12	Preparing the third chapter of the thesis	26.02.2024 – 21.04.2024	
13	Preparing the introduction and conclusion	22.04.2024 – 12.05.2024	
14	Completing the graduation thesis	13.05.2024 – 26.05.2024	
15	Handing in the thesis for compliance control and antiplagiat	27.05.2024 – 9.06.2024	
16	Getting acquainted with the feedback and review	10.06.2024	
17	Presenting the written thesis	11.06.2024	

Academic adviser _____ / Vasin S. M. /
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The assignment was accepted by Master's degree student _____ / Wang Huimin /
(signature) (full name)

Summary

The graduation thesis comprises 71 pages, 3 chapters, 15 figures, 7 tables, 74 sources. INTERNATIONAL LOGISTICS, TRANSPORT, LAWS AND REGULATIONS, INFORMATIZATION, PROFESSIONAL LOGISTICS PERSONNEL TRAINING SYSTEM, OCEAN FREIGHT, AIR FREIGHT.

The target of research is study of international logistics is helpful to understand the coping strategies of these risks and challenges, provide risk management and crisis response support for enterprises, and ensure the smooth progress of international logistics.

The goal of the research is to analyze current state and development of international logistics in modern economy.

The results of research include: make overview of international logistics; analyze problems existing in international trade logistics; underline suggestions and countermeasures to promote development of international logistics.

The main research methods used in this paper are as follows: literature research methods and qualitative analysis method: After establishing the core goal of this study, I consulted a lot of information about international logistics, collected a lot of relevant information, and read a lot of excellent papers in China HowNet, online news and international journals in order to sort out, closely follow the research direction of this paper, further think about the research theme, and then analyze the core goal of the current situation and development trend of international logistics.

Novelty of this study is in order to locate the present situation and development trend of international logistics more accurately, this paper synthesizes the development environment, logistics system, system problems and future development trend of international logistics, and makes a qualitative analysis of them.

The recommendations on disseminating and applying the results are as follows: the theoretical and practical significance of work involves the possibility of using thesis's materials in scientific, pedagogical and practical work.

The theoretical relevance of the thesis is established by processing and analysing a large number of theoretical works, norms and legal documents on the procedure. The theoretical relevance of the thesis was established by processing and analysing a large number of theoretical works, norms and legal documents.

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Introduction

With the increasing frequency of international economic exchanges, countries all over the world are developing international trade while attaching importance to developing domestic economy. International trade is the key factor to promote the rapid economic development, and international trade logistics is the booster of international trade development. The development of international trade logistics plays a positive role in promoting the development of international trade and can promote the realization of national trade. International logistics refers to the general name of logistics activities that cross national boundaries. With the process of economic globalization and the continuous expansion of international trade, international logistics develops rapidly and plays a vital role in international trade.

First of all, international logistics helps to promote the development of international trade. International logistics provides logistics services required by international trade, including transportation, storage, packaging, loading and unloading, distribution and other links of goods. International logistics enables goods to be transported smoothly from the place of production to the place of sale, which provides strong support for international trade. At the same time, international logistics has also promoted the diversification and large-scale development of international trade and expanded the scope and scale of trade. Secondly, international logistics helps to improve trade efficiency.

International logistics can improve the efficiency of trade operation by optimizing logistics process, improving logistics efficiency and reducing logistics cost. For example, international logistics, through the reasonable choice of transportation mode and the optimization of transportation route, can shorten the transportation time of goods, reduce logistics costs and improve the speed and accuracy of delivery. In addition, international logistics can also achieve economies of scale, reduce logistics costs and improve trade efficiency through centralized procurement, warehousing and distribution. Third, international logistics helps to strengthen supply chain management. International logistics organically connects all links in the supply chain and improves the coordination and management efficiency of the supply chain. Supply chain refers to a series of activities and

processes from raw material suppliers to final consumers. International logistics provides logistics services, so that all components of the supply chain can operate efficiently and meet market demand. For example, international logistics can share information in the supply chain, improve forecasting accuracy, reduce inventory and reduce supply chain management costs. In addition, international logistics also contributes to the development of cross-border electronic commerce. With the rapid development of Internet and e-commerce, cross-border electronic commerce has become a new form of international trade. International logistics provides basic conditions for the development of cross-border electronic commerce by providing fast, safe and convenient logistics services.

By realizing real-time tracking and visualization of logistics information, international logistics improves the controllability and reliability of logistics and promotes the development of cross-border electronic commerce. Finally, international logistics helps to promote regional economic integration. Regional economic integration refers to the process of realizing economic integration and mutual benefit and win-win by strengthening economic and trade cooperation and lowering trade and investment barriers in a specific geographical area. By providing transnational logistics services, international logistics promotes economic exchanges and logistics cooperation among countries in the region and helps to promote the process of regional economic integration. For example, the EU promotes the integration of European regional economy by establishing a common market and a free trade area, while international logistics supports the flow of goods among EU member States.

In a word, international logistics plays a vital role in international trade. It not only provides important support and guarantee for international trade, but also promotes the improvement of trade efficiency, strengthens supply chain management, promotes the development of cross-border electronic commerce and regional economic integration. Therefore, strengthening the construction of international logistics system and improving the quality and efficiency of international logistics services are of great significance for promoting economic globalization and promoting the development of international trade.

The research object of this paper is international logistics. The subject is current state and development of international logistics.

The goal of the research is to analyze current state and development of international logistics in modern economy.

Tasks of this paper are:

- make overview of international logistics;
- analyze problems existing in international trade logistics;
- underline suggestions and countermeasures to promote development of international logistics.

Novelty of this study is in order to locate the present situation and development trend of international logistics more accurately, this paper synthesizes the development environment, logistics system, system problems and future development trend of international logistics, and makes a qualitative analysis of them.

The research background of this paper is based on the following five aspects:

1 Globalization trend: with the deepening of globalization, trade between countries has become increasingly frequent, and the number and scale of multinational enterprises have been expanding. This provides a huge development space and market demand for international logistics. Studying international logistics can deeply understand the logistics operation mode and trend under the background of globalization, and provide reference for enterprises and governments to formulate relevant policies and strategies.

2 Supply chain management needs: international logistics involves the whole process from raw material procurement, manufacturing to final product sales, and the management and optimization of supply chain is very important to the competitiveness of enterprises. Studying international logistics can help enterprises understand the connection and coordination of all links in the supply chain and improve the reliability and efficiency of the supply chain.

3 Promote technological innovation: with the rapid development of information technology, new technologies such as Internet of Things, big data and artificial intelligence have been widely used in the field of international logistics. The application of these technologies has greatly improved the information and intelligence level of international logistics, and also brought new development opportunities and challenges. Learning

international logistics can focus on how these technological innovations promote the transformation and upgrading of the logistics industry.

4 Changes in the international trade environment: changes in the international trade environment have an important impact on international logistics, such as the adjustment of trade policies and the setting of tariff barriers. Studying international logistics can understand the impact of these changes on logistics operation and provide support for enterprises to formulate coping strategies.

5 Transformation and upgrading of the logistics industry: with the development of the global economy and the intensification of market competition, the logistics industry is facing a critical period of transformation and upgrading. The study of international logistics can help us understand the development trend and emerging formats of logistics industry, and provide guidance for the innovation and transformation of logistics enterprises.

The main research methods used in this paper are as follows: literature research methods and qualitative analysis method: After establishing the core goal of this study, I consulted a lot of information about international logistics, collected a lot of relevant information, and read a lot of excellent papers in China HowNet, online news and international journals in order to sort out, closely follow the research direction of this paper, further think about the research theme, and then analyze the core goal of the current situation and development trend of international logistics.

The significance of this paper lies in the following five aspects: promoting the process of globalization: as an important part of globalization, the study of international logistics is helpful to deepen the understanding of the process of globalization. By studying international logistics, we can better understand how multinational enterprises organize production and sales on a global scale, as well as the trade flow and cooperation mode between countries. This will help promote the further development of globalization and promote economic ties and cooperation among countries. Promote trade facilitation: international logistics research helps to simplify trade processes, reduce trade costs and improve trade efficiency, thus promoting trade facilitation. By optimizing the international logistics operation process and reducing the time and cost of customs declaration, transportation and other links, it can provide enterprises and consumers with more

convenient, fast and safe commodity purchase and service experience. Enhance the competitiveness of enterprises: international logistics research can provide guidance for enterprises to optimize resource allocation, reduce costs and improve efficiency. By studying international logistics, enterprises can understand the demand and trend of the global market, formulate more reasonable production and sales strategies, and thus enhance their competitiveness. Promote economic growth: as an important bridge connecting global production and consumption, international logistics research contributes to the growth and prosperity of the global economy. By studying international logistics, we can understand the development trends and laws of global trade, provide decision support for the government and enterprises, and promote the sustainable development of the global economy. Dealing with risks and challenges: international logistics faces many risks and challenges, such as transportation safety, cargo loss and regulatory differences. The study of international logistics is helpful to understand the coping strategies of these risks and challenges, provide risk management and crisis response support for enterprises, and ensure the smooth progress of international logistics.

Chapter 1 Overview of international logistics

1.1 Concept and characteristics of international logistics

International logistics, in short, is the planning, implementation, control and management process of cross-border material flow and storage. It covers all logistics links from suppliers to final consumers, including transportation, warehousing, loading and unloading, packaging, distribution and information processing [31]. With the deepening of globalization and frequent international trade, international logistics came into being and gradually developed into an important part of modern logistics industry. International logistics can be divided into maritime logistics, air logistics, land logistics and multimodal transport. Maritime logistics is characterized by low cost and large volume, which is suitable for the transportation of bulk commodities; Air logistics is fast, but the cost is high, which is suitable for high-value and urgently needed goods; Land transportation logistics includes roads and railways, with moderate cost and suitable for short-distance transportation; Multimodal transportation combines the above modes of transportation, realizing the optimization of transportation efficiency and cost. Figure 1 is international traffic flow chart, as shown below:

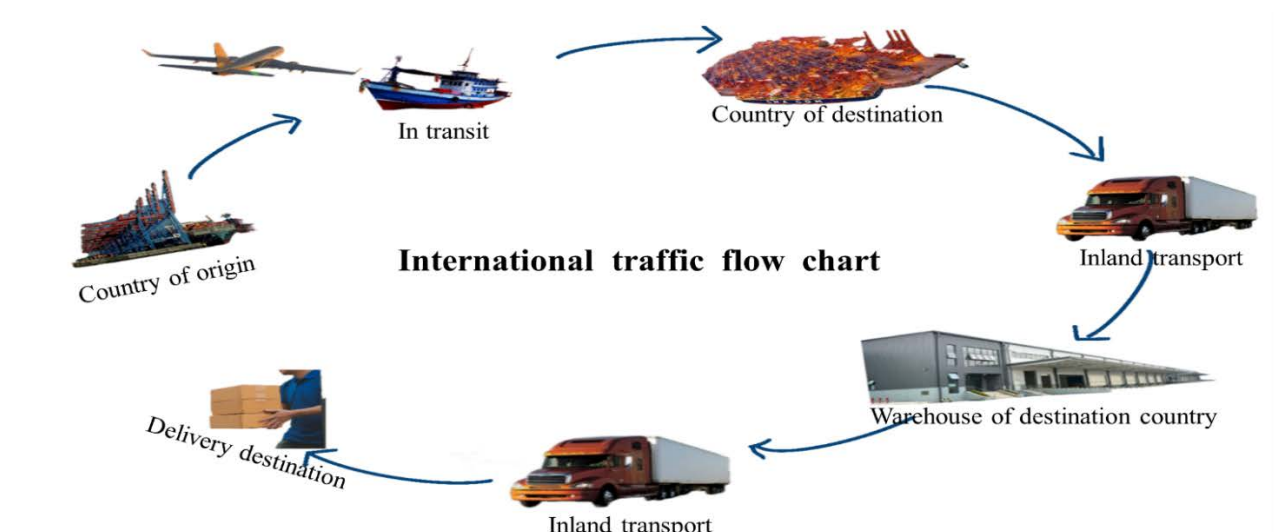


Figure 1 – International traffic flow chart [10]

With the continuous progress of science and technology and the in-depth development of globalization, international logistics will usher in a broader development space and challenges. On the one hand, the application of advanced technologies such as Internet of Things, big data and artificial intelligence will further promote the intelligent, automated and green development of international logistics; On the other hand, the deep integration of global supply chain and the change of trade pattern will also put forward higher requirements and challenges for international logistics. International logistics plays a vital role in modern economy. It can not only effectively connect the production, consumption and markets of various countries, promote the smooth progress of international trade, but also create greater value for enterprises by optimizing resource allocation and reducing transaction costs. In addition, international logistics has promoted cultural exchanges, scientific and technological progress and global economic development [1].

There are significant differences in the logistics environment of international logistics. As an important support of global economic integration and trade liberalization, international logistics involves cross-border cargo transportation, warehousing, loading and unloading, packaging, distribution and information management. With the continuous development of global trade, the importance of international logistics in modern economy is increasingly prominent. However, there are significant differences in political and economic systems, market size, technical level and cultural background between most countries and regions. Under the joint action of these factors, the logistics systems of various countries have formed their own unique logistics environment. At the same time, these differences bring challenges and opportunities for enterprises to carry out international logistics activities. The differences in the international logistics environment are mainly manifested in the following three aspects.

Differences in logistics systems: the logistics systems of different countries and regions have their own characteristics, which are mainly reflected in logistics network layout, transportation mode selection, storage facilities and information level. For example, European countries have developed logistics networks and perfect railway and highway transportation systems, while Southeast Asian countries have obvious advantages in water transportation [7].

Tables 1 and 2 respectively list the names and countries of the top 10 companies for shipping agents in 2024 and the names and countries of the top 10 companies for air freight agents in 2024, as well as the annual loan amount of that year, as shown in the following data.

Table 1 – Top 10 Ocean Freight Forwarders [53]

Rank 2024	Company	Headquarters	Ocean Containers(TEU)
1	Kuehne + Nagel	Switzerland	4338000
2	Sinotrans Ltd.	China's mainland	4309000
3	DHL Supply Chain & Global Forwarding	Germany	3089000
4	DSV A/S	Denmark	2519295
5	DB Schenker	Germany	1744000
6	Nippon Express	Japan	1698161
7	LX Pantos	South Korea	1537000
8	C.H. Robinson Worldwide	United States	1353750
9	Kerry Logistics	Hong Kong, China	1261775
10	Ceva Logistics	France	1150000

Table 2 – Top 10 Air Freight forwarders [53]

Rank 2024	Company	Headquarters	Containers(TEU)
1	Kuehne + Nagel	Switzerland	1983000
2	DHL Supply Chain & Global Forwarding	Germany	1672000
3	DB Schenker	Germany	1326000
4	DSV A/S	Denmark	1305827
5	Sinotrans Ltd.	China's mainland	902000
6	UPS Supply Chain Solutions	United States	783000
7	Expeditors International of Washington	United States	782000
8	Nippon Express	Japan	693546
9	AWOT Global Logistics Group	China's mainland	590000
10	Hellmann Worldwide Logistics	Germany	575000

Differences in regulations and policies: countries have different laws and policies in the field of logistics, including customs, taxation, quarantine and environmental protection. These differences directly affect the logistics cost, efficiency and risk management of enterprises.

Differences in infrastructure construction: the level of infrastructure construction is directly related to the efficiency and cost of international logistics. Developed countries

usually have relatively perfect transportation networks, advanced storage facilities and efficient information platforms, while developing countries may have shortcomings in these aspects.

The scope of international logistics system is very wide, which not only covers the functional elements of logistics itself, such as transportation, warehousing, loading and unloading, packaging and distribution, but also needs to communicate and coordinate with external systems around the world [57].

These external systems include, but are not limited to, customs, taxation, quarantine, environmental protection departments in different countries and various international logistics cooperation platforms. Therefore, the scope of the international logistics system involves not only the vastness of the region, but also the complexity of various internal and external factors. The direct consequence of this universality is the increase of difficulty and complexity, and it also increases the risk of international logistics. Due to the long transportation route, many links and complex climatic conditions, the requirements for the custody and storage of goods in transit are high, which makes the risks in international logistics greater than those in domestic logistics. For example, the risk of loss, shortage and delay of goods may increase, and at the same time, it is necessary to face the credit risk and national risk brought about by exchange rate changes and differences in political and economic environment. However, it is this universality that brings great opportunities for international logistics.

With the continuous development of global trade and the increasing number of multinational enterprises, the demand for international logistics continues to grow. By optimizing transportation channels, adjusting warehousing management strategies and improving information platforms, enterprises can seize these opportunities, enhance their international logistics operation capabilities and achieve sustainable development. The increasing number of overseas warehouses in some major countries also proves to the world that the scope of international logistics is expanding at a very fast speed.

Figures 2 and 3 show the number and growth rate of overseas warehouses in major countries and regions from 2020 to 2022, as shown in the following data.

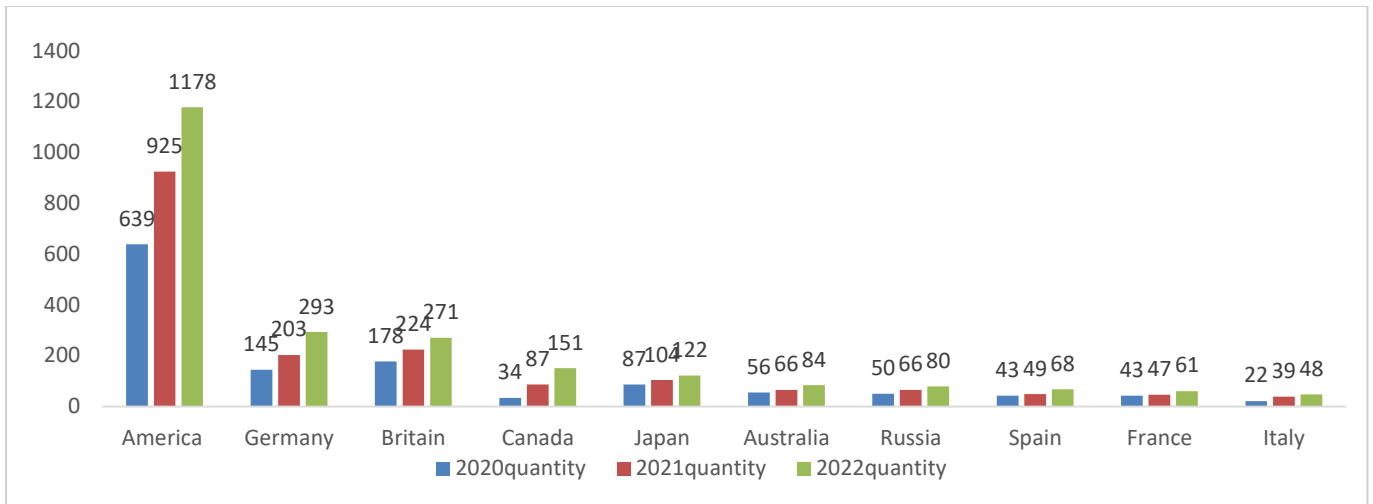


Figure 2 – Number of overseas warehouses in major countries and regions in 2020-2022 (units)[64]

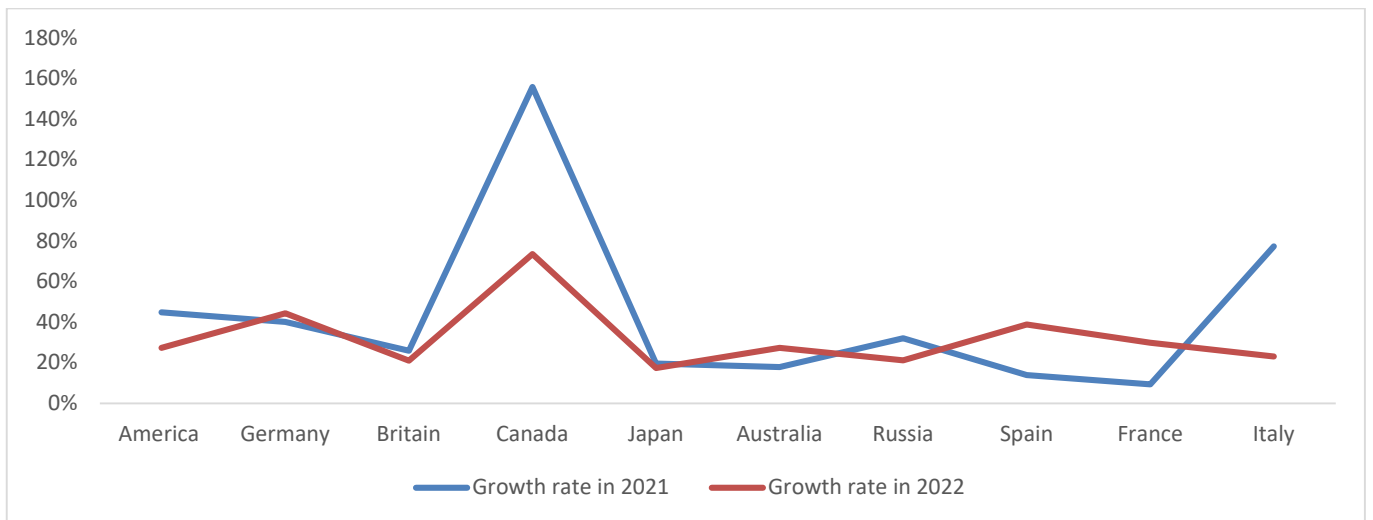


Figure 3 – Growth rate of overseas warehouses in major countries and regions from 2020 to 2022 (%) [64]

International logistics must be supported by international information system, which is an important supporting means of international logistics, especially international intermodal transport. An effective international logistics information system is very important for grasping the actual situation of ports, airports, intermodal routes and stations in time and providing support for supply or sales logistics decision-making. The international information system can share and update information in real time, which makes the information transmission between all links more rapid and accurate. This helps enterprises to know the transportation status and inventory of goods in time, so as to make

more informed decisions. By collecting and analyzing a large number of logistics data, international information system can help enterprises optimize resource allocation and improve logistics efficiency. By forecasting the demand for goods and transportation time, enterprises can arrange transportation plans and storage space more reasonably [54]. International information system can also reduce risks and costs in international logistics. By monitoring the transportation process of goods in real time, enterprises can find potential risks in time and take corresponding measures.

At the same time, enterprises can reduce transportation costs by optimizing transportation routes and reducing unnecessary intermediate links. International information system not only improves the efficiency and accuracy of international logistics, but also provides more decision support for enterprises and helps to enhance their international competitiveness. EDI(Electronic Data Interchange), that is, electronic data exchange, is a technology that realizes the automatic transmission and processing of business documents between different enterprises through computer communication network according to unified standards and formats. EDI technology is also an important pillar technology of modern international logistics information system. In the field of modern logistics, EDI technology has been widely used and has become a key tool to improve logistics efficiency, reduce costs and enhance competitiveness. At the same time, international logistics is the earliest field to develop electronic data interchange (EDI), and international logistics based on EDI will have a great impact on logistics internationalization. Figure 4 shows the application process of EDI technology in customs.

The standardization of international logistics requires higher requirements. In international logistics, standardization is the key to improve efficiency and reduce costs. By formulating unified technical standards, management standards and working standards, the standardization, unification and high efficiency of logistics systems can be realized. The basic principles it follows include simplification, unification, coordination and optimization. By simplifying the logistics process, unifying technical standards, and coordinating the cooperation among all links, the overall optimization of the logistics system is finally realized.

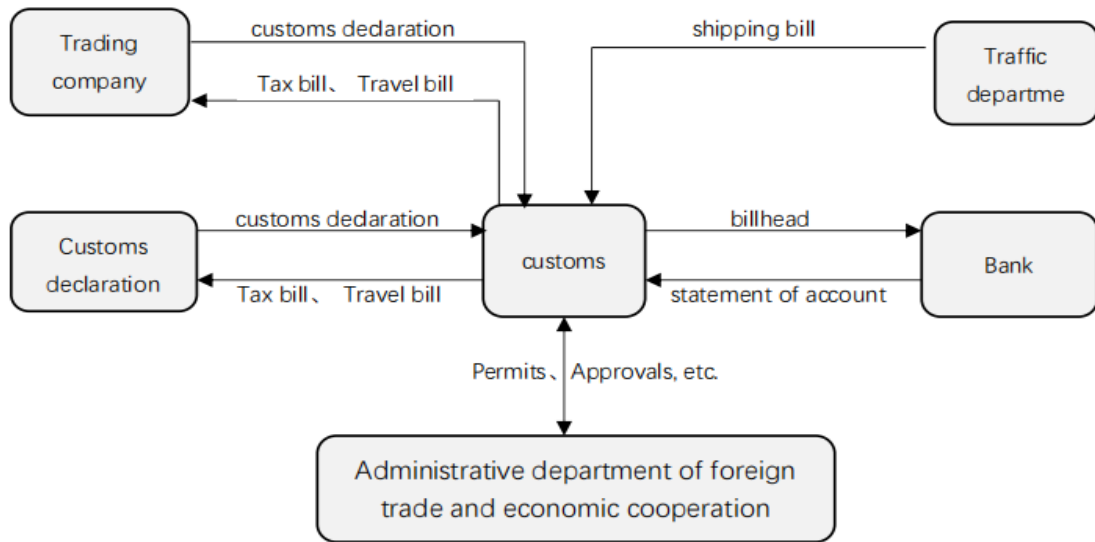


Figure 4 – Application of EDI technology in customs [62]

Unifying standards means reducing misunderstandings and frictions and improving the transparency and predictability of information. Standardization not only simplifies the complicated logistics process, but also helps to ensure the smooth flow of goods and information. In international logistics, the standardization of transportation, storage and information exchange is also very important. Taking transnational trade as an example, adopting uniform container size and loading standards can improve transportation efficiency and reduce loading and unloading time. In the warehousing link, adopting standardized warehousing management system can realize real-time updating and sharing of inventory information and improve the level of warehousing management; In addition, in terms of information exchange, the adoption of internationally accepted documents and file formats can ensure the rapid and accurate transmission of information and improve logistics efficiency. International logistics standardization takes international logistics as a large system, and formulates the technical standards of various subsystems such as internal facilities, mechanical equipment and special tools. Formulate working standards in various fields within the system, such as packaging, loading and unloading, transportation and so on; Based on the system, this paper studies the compatibility of technical standards and working standards in each subsystem and sub-field, and unifies the standards of the whole target logistics system according to the requirements of compatibility [52]. The content of

standardization is actually the common rules after optimization. Internationally, the Geneva International Organization for Standardization (ISO) is responsible for coordinating worldwide standardization issues in order to promote worldwide common rules. ISO has made uniform provisions on the standards of international logistics systems. The list of participants in relevant international logistics technical committees is shown in table 3:

Table 3 – List of participants of International Logistics Standardization Technical Committee [50]

Numbering	Name	Secretarial State
ISO TC7	Shipbuilding	Netherlands
ISO TC22	Highway vehicles	France
ISO TC51	Tray	Britain
ISO TC96	Crane	Australia
ISO TC100	Chains and sprockets	Britain
ISO TC101	Continuous loading and unloading equipment	France
ISO TC104	Container	America
ISO TC110	Industrial vehicles	France
ISO TC122	Wrap	Canada
ISO TC883	Cargo operation sign	
ISO TC4	Logistics (coordinating relevant standards)	

To sum up, international logistics is a complex and huge system, which not only involves maritime logistics, air logistics, land logistics and multimodal transport, but also emphasizes the differences in logistics environment, the wide range of international logistics systems, the need for information support and the high requirements for standardization of international logistics. The development of international logistics is of great significance to the global economy and trade. It promotes the growth of global trade, expands markets and expands consumer groups, optimizes the supply chain and reduces costs, promotes regional economic integration and promotes sustainable development. The continuous development and innovation of international logistics will bring more opportunities and challenges to the global economy and promote the further development of economic globalization and interconnection.

1.2 International logistics system

International logistics serves international traders and multinational companies. International trade and international production system are two closely related and extremely complex large-scale systems, which are an open economic system with coordinated operation composed of many subsystems and subsystems. The international logistics system serving trade activities consists of subsystems such as packaging, storage, transportation, inspection, distribution processing and its arrangement, repackaging and international distribution. Among them, warehousing, transportation and distribution are the basic functions of international logistics, and a large number of warehousing outlets are often set up in international logistics centers to provide warehousing, transportation and distribution services for international logistics.

On the other hand, the international production system includes many links such as international procurement, internal storage and transportation of raw materials, international production and processing, storage and transportation of finished products, international marketing, research and development, international enterprise infrastructure and globalization strategy, which all constitute the content of international logistics activities under global production conditions. Compared with pure international trade logistics, international logistics activities generated by international production are often more complex and strategic. International logistics uses international logistics networks, logistics facilities and logistics technologies to realize the international flow and exchange of goods, so as to promote the development of regional economy and the optimal allocation of world resources, and promote the process management of global integrated supply chain. It can be seen that international logistics is a highly integrated concept with obvious system integration characteristics.

Figure 5 and Figure 6 are the operation mode of the international logistics system and the framework of the international logistics function system respectively, as shown in the following figure:

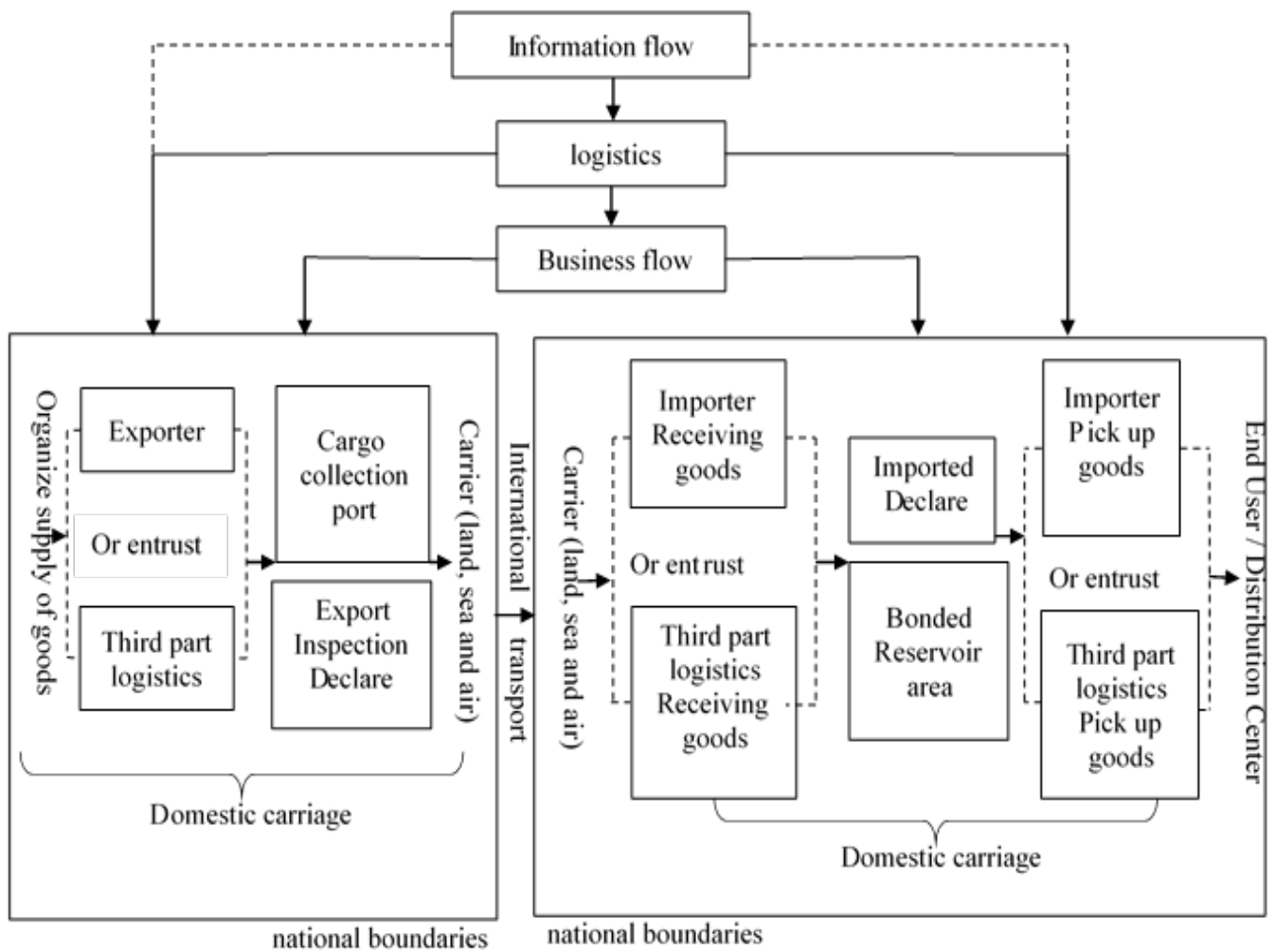


Figure 5 – Operation mode of international logistics system [12]

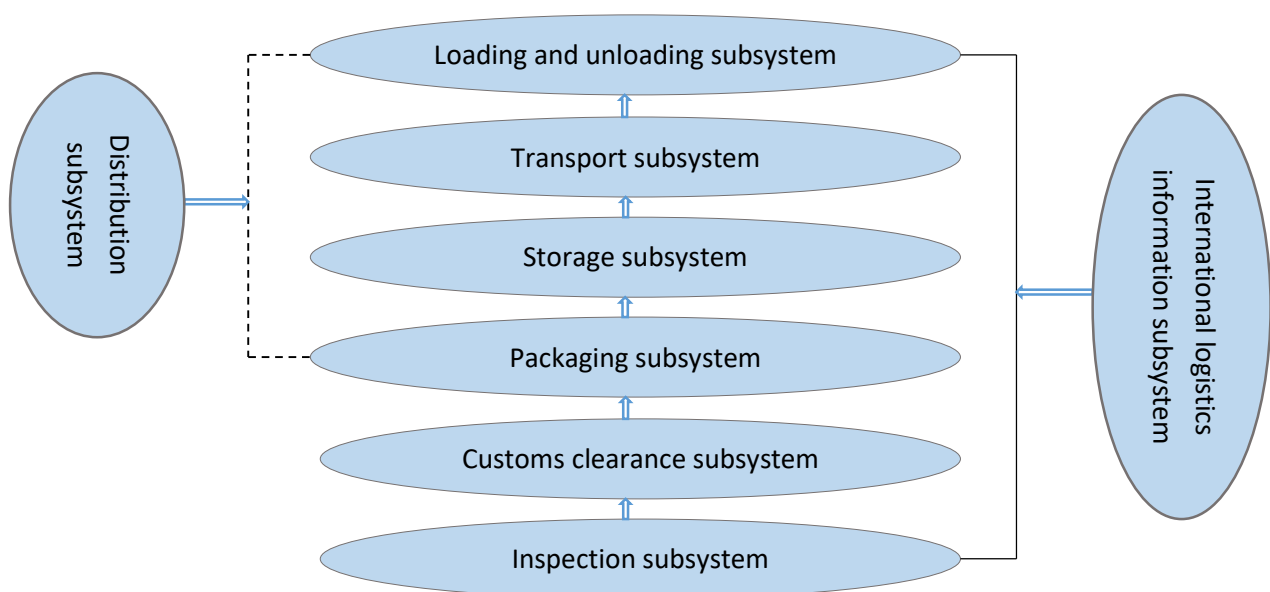


Figure 6 – Framework of International Logistics Function System [12]

International logistics transportation subsystem is an important part of international logistics system. Specifically, it involves the transportation of goods, including road, railway, air, sea and other modes of transportation. The main function of this subsystem is to transport goods safely and quickly from the place of departure to the destination through various means of transportation and equipment. In international logistics, the transportation subsystem closely cooperates with other subsystems such as warehousing, loading and unloading, customs declaration, etc., and together constitutes a complete logistics chain. The efficient operation of transportation subsystem is very important to the overall efficiency and benefit of international logistics. At the same time, with the continuous development and innovation of logistics technology, the international logistics transportation subsystem is also constantly optimized and improved. For example, by applying advanced logistics information technology and intelligent equipment, we can improve the efficiency and accuracy of transportation, reduce transportation costs and improve customer satisfaction.

The international logistics warehouse subsystem is an important part of the international logistics system, which is responsible for the storage, management and distribution of goods. The storage and custody of the warehouse subsystem makes the goods in a relatively stagnant state in its circulation process, which is absolutely necessary. Because commodity circulation is a continuous circulation process from decentralization to centralization and then from centralization to decentralization. Specifically, the warehouse subsystem needs to classify and store different types of goods to ensure the safety and integrity of goods during storage, which includes reasonable warehouse layout, goods classification, marking and stacking.

The warehouse subsystem needs to comprehensively manage goods, including goods warehousing, warehousing, inventory inquiry, inventory counting and other operations, which requires the establishment of a perfect warehouse management system to realize information and digital management of goods. The warehouse subsystem needs to pick, package and distribute goods according to the order information and the demand of goods distribution, which requires close cooperation with the transportation subsystem to ensure that the goods arrive at the destination on time and accurately. The warehouse subsystem needs to control the inventory according to the demand and supply of goods to avoid the

occurrence of inventory backlog or shortage. This requires inventory forecasting, inventory planning, inventory scheduling and other operations.

The international logistics commodity inspection subsystem is an important link to ensure that the quality and quantity of goods in international trade meet the contract requirements. This subsystem involves the inspection, appraisal, supervision and management of import and export commodities to ensure that the quality, quantity and packaging of commodities meet the international trade standards and contract requirements. Specifically, the main responsibilities and functions of the international logistics commodity inspection subsystem include: sampling, inspection, testing and appraisal of import and export commodities to ensure that the quality and quantity of commodities meet the contract provisions and international trade standards, which involves appearance inspection, size inspection, weight inspection, performance testing and many other aspects.

Check the packaging of the goods to ensure that the packaging conforms to the contract provisions and international trade standards, and can protect the safety and integrity of the goods during transportation. This involves packaging materials, packaging methods, packaging identification and many other aspects. Supervise and manage the production, processing, storage and transportation of import and export commodities to ensure the stability and reliability of commodity quality and quantity. This includes establishing a quality management system, conducting quality evaluation and monitoring, and handling quality problems and complaints.

The commodity packaging subsystem of international logistics is an indispensable part of international logistics, which is mainly responsible for the design and implementation of commodity packaging to ensure the safety, integrity and convenience of commodities during transportation and storage. The main responsibilities and functions of the subsystem include: designing packaging materials and methods according to the characteristics of goods, transportation requirements and market demand, and packaging design needs to consider many factors such as commodity protection, convenient transportation and cost reduction; According to the requirements of packaging design, we should pay attention to the selection of packaging materials, the correctness of packaging methods and the clarity of packaging marks during the packaging process.

Check the packaged goods to ensure that the packaging conforms to the contract provisions and international trade standards, and can protect the safety and integrity of the goods during transportation. In international logistics, commodity packaging subsystem closely cooperates with other subsystems such as transportation, warehousing and customs declaration to form a complete logistics chain. Reasonable packaging design and implementation can reduce the damage and loss of goods, improve transportation efficiency, reduce logistics costs, and also help to enhance the market competitiveness and image of goods.

International logistics information subsystem is an important part of international logistics system, which is mainly responsible for collecting, processing and transmitting international logistics information. With the help of advanced information technology, the subsystem realizes real-time monitoring, analysis and prediction of logistics information, and provides strong support for international logistics decision-making. The main functions of the international logistics information subsystem include: collecting all kinds of information in the logistics process in real time through various sensors, scanning equipment, RFID and other technical means, such as the position and state of goods, the operation of transportation tools, etc.

Cleaning, integrating, analyzing and mining the collected information to extract valuable information and provide support for logistics decision-making. The processed information will be transmitted to relevant personnel and departments in real time through technical means such as network and database, so that they can know the logistics situation in time and make corresponding decisions. The characteristics of international logistics information system are large amount of information and frequent exchange. Large transmission capacity and strong timeliness; Many links, many points and long lines. Therefore, it is necessary to establish an international logistics information system with advanced technology. The development of EDI in international trade is an important trend. Countries should strengthen the application of EDI in international logistics and build expressways for international trade and transnational operation.

The above-mentioned main systems should be organically linked with distribution system, loading and unloading system and distribution processing system, and make overall

consideration and overall planning to establish an international logistics system that meets the requirements of international competition. One end of the international logistics system is connected with production, and the other end is connected with consumption, which is international, so it is a veritable complex open system operation. International logistics system is an organic whole with specific functions, which carries out logistics activities in a certain time and space (including domestic, inter-country, inter-regional and inter-continent) and consists of logistics personnel, logistics facilities, materials to be transported and logistics information. A series of processes such as system synthesis, system analysis and system management of international logistics system is the operation of international logistics system. .The operation of international logistics system is the inevitable trend of the development of container transport and international multimodal transport, and it is the "second revolution of international transport industry" after container transport. The operation of international logistics system has become the main force in the world transportation industry in the 21st century with its modern management means, high-quality service level, good cooperative relationship with shippers and high-tech communication. .Efficiency and optimization are the two major goals of international logistics system operation. The so-called efficiency means to construct, organize and manage the above functions of logistics as a system. The common goal of each subsystem of logistics is the efficiency of logistics, and it is this common goal that produces the necessity of closely linking all logistics functions. The so-called optimization, that is, applying the efficiency and cost analysis of the logistics system to optimize the structure, organization and management of the system operation, so as to achieve a certain logistics service with the lowest operating cost of the overall logistics system. Therefore, the international logistics system must operate in a suitable area, make use of perfect soft and hard environment, and achieve the required logistics service level with the least logistics cost.

Chapter 2 Problems existing in international trade logistics

2.1 International logistics infrastructure

With the continuous advancement of globalization, the international logistics industry has developed rapidly and become an important link connecting the economies of various countries. As an important part of logistics industry, international logistics infrastructure plays a vital role in improving logistics efficiency, reducing costs and enhancing the stability and security of supply chain. However, the current international logistics infrastructure is generally imperfect, which seriously restricts the development of the international logistics industry.

In the field of international logistics, the imperfect infrastructure is mainly manifested in the following aspects: the level of construction and maintenance of transportation facilities, including ports, airports, railways and highways, is uneven, and some facilities have serious congestion, aging and insufficient maintenance; Some international logistics nodes have backward storage facilities and limited storage capacity, so it is difficult to meet the growing logistics demand. There are some problems in international logistics information transmission system, such as slow data transmission speed and low accuracy, which affect the real-time and accuracy of logistics information.

Perfect international logistics infrastructure means more advanced transportation network, more efficient information processing system and more convenient goods distribution center, which will greatly improve logistics efficiency, shorten logistics time and accelerate the transfer of goods from production to consumption. Efficient infrastructure will reduce unnecessary transit links, reduce transportation losses and increase loading rate, thus reducing logistics costs [35].

At the same time, the optimized logistics path and transportation mode can further reduce logistics costs and improve the economic benefits of logistics enterprises. Perfect international logistics infrastructure can help enterprises to respond to market demand more quickly and accurately, improve customer service level, which will help enterprises win more market share and improve their competitiveness in the international market.

The main reasons for the imperfection of international logistics infrastructure are as follows: there are great differences in the level of economic development in different countries and regions, which leads to differences in investment and construction of international logistics infrastructure. If we observe the infrastructure of different countries, we can see that the higher the level of economic development, the better the infrastructure construction, and the higher the density of roads and railways, while the relatively backward level of economic development, the infrastructure construction is insufficient, and the density of roads and railways is also low, as shown in figures 7 and 8.

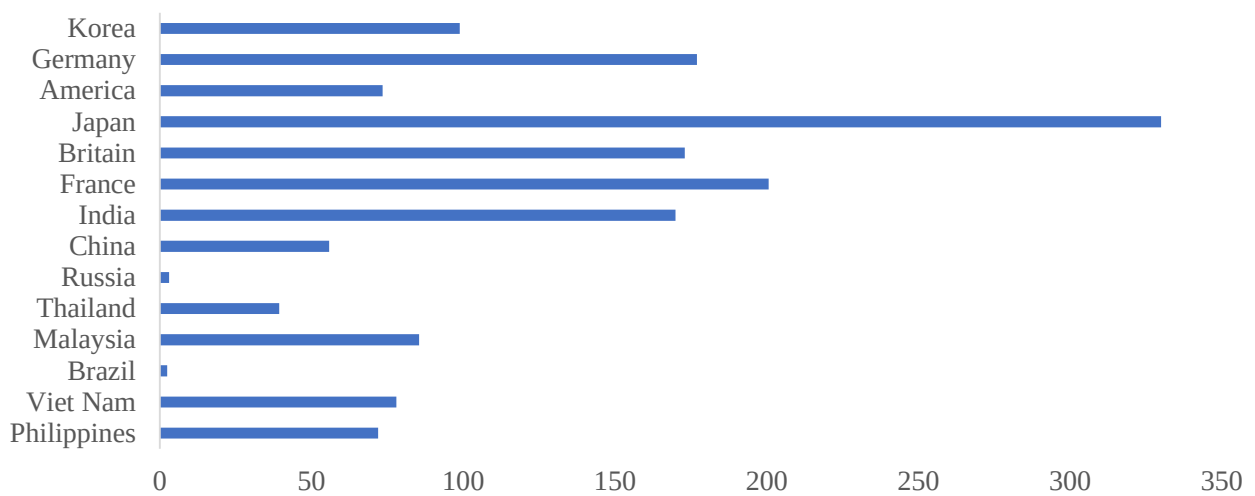


Figure 7 – Highway density in the world [6]

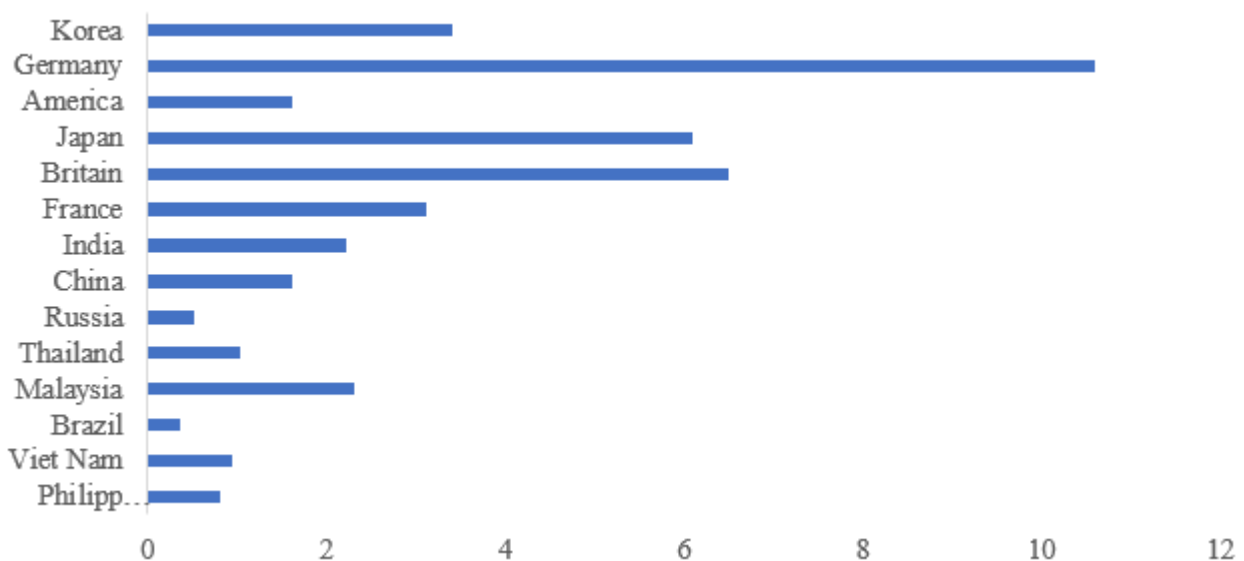


Figure 8 – Railway density in the world [60]

Because international logistics infrastructure construction needs a lot of capital investment, some countries and regions are facing the problem of capital shortage, which leads to the lag of infrastructure construction; Backward technical level: Some countries and regions are relatively backward in logistics technology and lack of advanced logistics facilities and technical support, which makes it difficult to improve the overall level of international logistics infrastructure, resulting in the inability to keep up with freight capacity. Some countries with higher infrastructure level will have relatively strong freight capacity, as shown in table 4.

Table 4 – World Airport Freight Throughput TOP10 in 2023 [21]

№	Airport	Code	Country	Throughput (10,000 tons)
1	Hong Kong International Airport	HKG	China	433.2
2	Memphis International Airport	MEM	America	388.2
3	Ted Stevens Anchorage International Airport	ANC	America	360
4	Shanghai Pudong International Airport	PVG	China	344
5	Miami International Airport	MIA	America	278
6	Incheon International Airport	ICN	Korea	274.4
7	Louisville International Airport	SDF	America	272.8
8	Hamad International Airport	DOH	Qatar	234.1
9	Taiwan Taoyuan International Airport	TPE	China	211.3
10	Guangzhou Baiyun International Airport	CAN	China	203.1

The improvement of infrastructure level can improve the production and transaction efficiency of market players, reduce the cost of enterprises, and improve the total factor productivity and labor productivity. On the other hand, strengthen the flow of factors between different regions, promote the development of urban and rural areas, reduce the incidence of poverty, and at the same time promote the complementary advantages between regions and narrow the regional gap. The improvement of international logistics infrastructure is of great significance to improve logistics efficiency, reduce costs, enhance the stability and security of supply chain, enhance the facilitation of cross-border goods clearance, strengthen international interconnection and cooperation, promote diversified settlement and reduce exchange rate risks, and cope with the impact of environmental and climate change [9].

International logistics planning and layout is unreasonable. With the continuous development of global economy, international logistics planning plays an increasingly important role in multinational enterprises. Reasonable international logistics planning can greatly improve logistics efficiency, reduce operating costs and enhance the competitiveness of enterprises. However, in reality, many multinational enterprises have unreasonable layout in international logistics planning, which seriously affects the operational efficiency and economic benefits of enterprises, and there are many factors leading to unreasonable layout of international logistics planning.

When planning the layout of international logistics, there is often a lack of a global perspective on the entire logistics system. This makes it possible to ignore some important links or factors in the planning process, which may lead to the lack of coordination and cooperation among all links in the logistics process, and the links such as warehousing, transportation and distribution may not be smoothly connected, resulting in long transit time and delay of goods, making the logistics process complicated and inefficient, thus affecting the efficiency and benefit of the entire logistics system. Lack of overall view may lead to the dispersion of enterprises' investment in logistics, unable to form scale effect, thus increasing the logistics cost. In addition, due to the lack of coordination among all links in the logistics process, it may lead to unnecessary waste and loss, further increasing the cost [36].

Lack of global view may make enterprises unable to fully understand and master the changes and risks in the global logistics market. At the same time, enterprises lacking global vision may not be able to deal with these risks in time, thus having an impact on international logistics.

There are great differences in economic development level, infrastructure construction and policy support in different regions, which leads to great differences in the speed and scale of international logistics development in different regions. In some regions, there may be excess logistics resources and excessive concentration of logistics facilities, which will lead to fierce market competition, while in some regions, there may be shortage of resources and lagging logistics facilities, which will lead to transportation delay, backlog of goods and interruption of supply chain, which makes the layout of the whole logistics

system unreasonable and cannot meet the growing logistics demand. Uneven development may require enterprises to increase additional transportation and storage costs to make up for the shortage of logistics facilities in some areas, which may include using more expensive transportation modes, increasing transit links or renting additional storage space. This unbalanced market competition may lead enterprises in some areas to be at a disadvantage in logistics costs.

The interconnection in the international logistics system is communicated through information, and the scheduling of resources is also realized through information query. Therefore, there is always an international logistics information system that collects, processes, transmits, analyzes and applies international logistics information in the international logistics system. The basic functions of the international logistics information system are summarized as shown in figure 9.

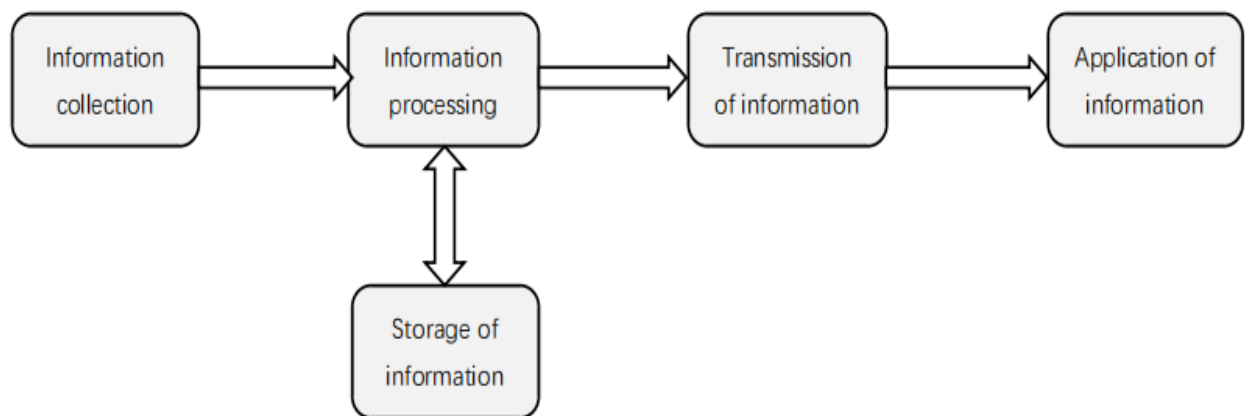


Figure 9 – Functional diagram of international logistics information system [27]

However, there is information asymmetry in the current international logistics system, which is mainly reflected in the transmission and sharing of logistics information. Because of information asymmetry, it may lead to unreasonable allocation of logistics resources and ineffective coordination among all links in the logistics process [61]. For example, suppliers may not be able to accurately understand the real-time demand of demanders, resulting in overstocked inventory or insufficient supply. At the same time, logistics companies may not be able to obtain accurate goods information, which may lead to transportation delays or wrong distribution, thus affecting the efficiency and benefits of the entire logistics system.

Due to information asymmetry, enterprises may need to invest more resources to obtain accurate information, including increasing manpower, material resources and financial resources. At the same time, information asymmetry may also make enterprises unable to understand market trends and competitors in time, which may lead enterprises to fail to formulate effective competitive strategies, reduce market competitiveness and miss business opportunities.

In addition, enterprises may face the risk of overstocking or shortage due to the inability to accurately predict market demand and supply, which will also increase additional costs. Information asymmetry may also lead to trust problems among all links in the supply chain. For example, suppliers may hide product quality problems or delivery delays, and demanders may not be able to accurately evaluate suppliers' capabilities and reputation. These trust problems may increase the risk of supply chain interruption or cooperation breakdown [38].

In the field of international logistics, due to the lack of unified standards and norms, there are great differences between logistics systems in different countries and regions, which may lead to the waste and repeated construction of logistics resources, make the layout of the whole logistics system unreasonable, and without unified logistics standards and norms, the logistics systems in various countries and regions may be incompatible with each other, which may lead to transportation delays, goods damage, distribution errors and other problems, thus reducing the overall logistics efficiency. Due to the lack of uniform standards, logistics enterprises may need to invest more resources to meet the logistics requirements of different countries and regions, which may include purchasing different equipment, training employees, adjusting operating procedures, etc., thus increasing logistics costs. Inconsistent logistics standards and norms may also lead enterprises to face additional challenges when entering new markets.

For example, some countries may require enterprises to comply with specific logistics laws and standards, which may increase the cost and time for enterprises to comply with these laws and standards. Inconsistent standards and specifications may increase the uncertainty of the supply chain. For example, different packaging requirements may cause damage to the goods during transportation, and different customs clearance procedures may

cause the goods to be detained. These risks may lead to the interruption or delay of the supply chain. Lack of unified logistics standards and norms may also lead to opaque logistics information, which makes it impossible for all parties in the supply chain to accurately understand the real-time status and location of goods, increases the risk of information asymmetry, and may lead to decision-making mistakes [16]. Lack of uniform logistics standards and norms may also have negative impacts on the environment and society. For example, different emission standards may lead to environmental pollution, and different labor safety standards may affect employees' rights and interests.

Perfecting and strictly implementing the international logistics planning that meets the development needs of enterprises is of great significance for improving the competitiveness of multinational enterprises [45].

It can not only help enterprises reduce costs, improve efficiency and reduce risks, but also enhance customer satisfaction, enhance competitiveness, promote sustainable development, optimize resource allocation and enhance market adaptability. Therefore, multinational enterprises should pay more attention to and invest in international logistics planning, and constantly optimize logistics layout and management mode to meet the needs of global economic development.

To sum up, the backward international logistics infrastructure and unreasonable layout are two main problems facing the global logistics field at present. First of all, the backwardness of international logistics infrastructure is one of the key factors restricting the improvement of logistics efficiency. In some areas, especially developing countries and regions, the construction of logistics infrastructure is still lagging behind, such as imperfect transportation facilities such as ports, airports, railways and highways, and lack of advanced logistics equipment and information systems, which leads to the inefficiency of transportation, warehousing and distribution in the logistics process and is difficult to meet the rapidly growing demand for international trade.

Secondly, the unreasonable layout of international logistics is also an urgent problem to be solved. At present, the layout of global logistics network is not balanced, some areas are too concentrated, while others are relatively weak. This unreasonable layout leads to uneven distribution of logistics resources, excessive logistics pressure in some areas and

insufficient logistics demand in others, which not only increases logistics costs, but also affects the stability and reliability of logistics services. In a word, only by increasing investment, optimizing layout and strengthening international cooperation can we promote the healthy development of international logistics and provide strong support for the prosperity of global economy and trade.

2.2 Level of international logistics education

The level of international logistics education lags behind. With the deepening of globalization and the increasing frequency of international trade, the importance of the international logistics industry has become increasingly prominent. At the same time, the logistics industry, as the blood of modern economy, is connected with production and consumption. In the development of the logistics industry, talent is always the core factor that determines the competition of the industry, and the competitiveness of the country's own talents also affects the development of its own logistics industry. We can observe table 5 and figure 10 as follows:

Table 5 – Top 10 Global Freight Enterprises in 2023 [37]

Ranking	Name of the company	Headquarters location	Freight revenue (millions of dollars)
1	Amazon	America	117716
2	UPS	America	100338
3	FedEx	America	90155
4	DHL	Germany	87036
5	Matuji group	Denmark	80023
6	US postal service	America	78507
7	Dafei shipping group	France	74500
8	China cosco shipping group	China	58108
9	Kuehne & Nagel	Switzerland	45066
10	S.f.Holding Co.,Ltd	China	41838

Combining the data in Table 5 and Figure 10, we can observe that the countries that belong to the top 10 global freight logistics enterprises are among the best in the global talent competitiveness index, the most typical one is the United States, and four of the top

10 global freight logistics enterprises belong to the United States, and its talent competitiveness index is the first in the world.

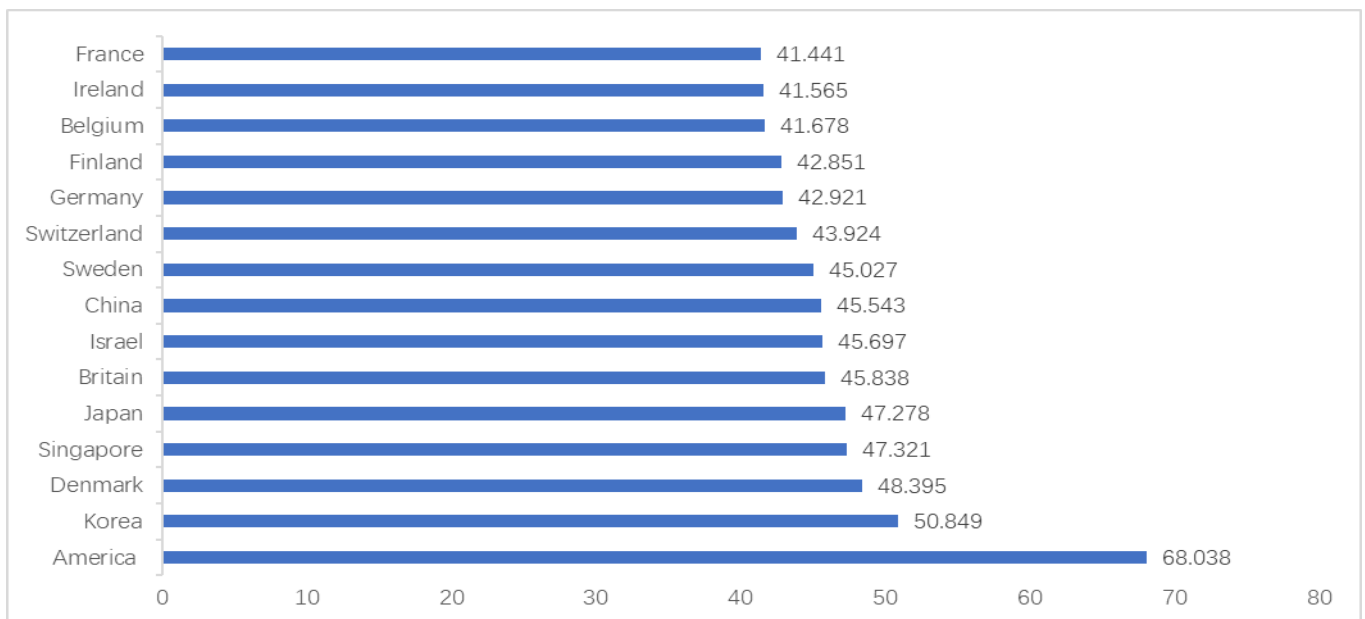


Figure 10 – Talent competitiveness index of 15 countries [49]

Denmark and China are close behind, and Maersk Group, which belongs to Denmark, ranks fifth among the top 10 global freight logistics enterprises, and is not far behind in the talent competitiveness index, ranking third, second only to South Korea. China also owns COSCO Shipping Group and Shunfeng Express among the top 10 freight logistics enterprises in the world, and its talent competitiveness index ranks eighth [72]. At the same time, France, Switzerland and Germany have also made good achievements in freight logistics and talent competitiveness, which shows that the development of talents has a far-reaching impact on the logistics industry.

International logistics education can transport a large number of specialized talents for the logistics industry, which meets the demand for high-quality talents. At the same time, with the rapid development of the logistics industry, the demand for talents with international vision and professional skills is increasing, which also improves the employment rate of related majors [68]. By providing comprehensive theoretical knowledge and practical training, international logistics education enables students to have the ability to deal with complex international logistics problems, which not only improves their professional ability in the logistics field, but also transports a large number of high-quality

talents for the logistics industry, thus improving the competitiveness of the whole industry. International logistics education emphasizes the importance of cross-cultural communication and international cooperation. By studying the logistics laws, practices and cultures of different countries, students can better adapt to the international environment and promote transnational cooperation and exchange, which is not only conducive to the international development of logistics industry, but also helps to strengthen economic ties and friendship between countries [43].

International logistics education encourages students to cultivate innovative thinking and problem-solving ability. By learning advanced logistics technology and management concepts, students can propose and implement new logistics schemes and promote the innovation and development of logistics industry. International logistics education can improve the efficiency of logistics operation by optimizing the management process of supply chain, so that students have the ability to improve the efficiency of international supply chain management, which will help reduce logistics costs, improve the quality of logistics services, and then enhance the competitiveness of the entire supply chain. In the complex international environment, enterprises are facing various risks and challenges. Talents with international logistics education background can better identify, evaluate and manage these risks and formulate effective coping strategies for enterprises, which will help to enhance the anti-risk ability of enterprises and ensure their stable operation [40].

In recent years, with the continuous development of the global economy and the increasing frequency of international trade, the international logistics industry has developed rapidly. However, compared with the rapid development of international logistics industry, international logistics education is relatively backward. At present, logistics education in many colleges and universities still stays on the traditional knowledge of logistics management, lacking in-depth research and targeted teaching in the field of international logistics. As a result, logistics students often feel that they have insufficient knowledge reserves when facing international logistics practice, and it is difficult to adapt to the complex and changeable international logistics environment. In the field of international logistics, the knowledge that logistics majors need to master includes international trade rules, international logistics laws and regulations, transnational transportation management,

international supply chain management, etc. These knowledge requires students not only to have a solid theoretical foundation, but also to have rich practical experience and practical operation ability [12].

However, at present, the teaching content of logistics majors in many universities is relatively scarce, which is difficult to meet the knowledge needs of students. At present, the curriculum of logistics major in many colleges and universities is too broad, lacking in-depth research and characteristic courses in the field of international logistics, which makes it difficult for students to form a comprehensive and in-depth understanding of the field of international logistics during their study. At the same time, there are many kinds of teaching materials for logistics majors, but there are relatively few specialized teaching materials in the field of international logistics. Many teaching materials are outdated and lack of integration with international logistics practice, which is difficult to meet the actual needs of students. Moreover, traditional teaching methods pay attention to instilling theoretical knowledge and lack the cultivation of students' practical ability and innovative thinking, which makes it difficult for students to apply what they have learned to practice when facing practical problems [42].

At present, international logistics education usually adopts the traditional teaching mode, focusing on theoretical teaching, supplemented by a small number of case studies or laboratory simulations. Although this mode can provide students with a certain theoretical basis, it lacks practical operation and experience, and it is difficult to cultivate students' practical ability and problem-solving ability. Practice teaching and theoretical study are complementary and mutually reinforcing. Theoretical learning provides basic knowledge and theoretical support for practical teaching, which can help students transform theoretical knowledge into practical operation ability. The lack of practical teaching mode will lead to the disconnection between students' theoretical knowledge and practical ability and make it difficult to adapt to the actual working environment. The lack of practicality caused by outdated teaching mode, limited teaching resources and insufficient school-enterprise cooperation makes it difficult for students to gain practical experience and adapt to the rapid development of international logistics industry [33]. At the same time, the lack of practical

teaching mode will also affect students' employment competitiveness and make them face greater challenges in the process of job hunting.

With the acceleration of globalization, the international logistics industry has increasingly become an important pillar of the global economy. Under this background, the importance of international logistics education has become increasingly prominent. However, the shortage of teachers has become a bottleneck restricting the development of international logistics education, which has brought many negative effects to international logistics students and industry development.

First of all, the training of talents is lagging behind, which can not meet the demand of high-quality talents in the industry. Secondly, the quality of talents has declined, and students' practical ability and innovation ability have not been effectively improved; Finally, the limited development of the industry and the lack of the support of outstanding talents have restricted the competitiveness of the international logistics industry. At present, the shortage of teachers in the field of international logistics education is mainly manifested in the following aspects: first, the shortage of teachers can not meet the growing educational demand. Secondly, the quality of teachers is uneven, and some teachers lack practical experience and industry awareness; Finally, the structure of teachers is unreasonable and there is a lack of outstanding talents with international vision and innovative ability. The main reasons for the shortage of teachers in international logistics education are: first, the policy support is insufficient, and the government's investment in teacher training and introduction is limited. Second, the industry demand is growing rapidly, and the demand for high-quality talents in the logistics industry far exceeds the supply of education. Third, the low salary makes it difficult to attract and retain outstanding talents [14].

With the rapid development of global trade and continuous technological innovation, the international logistics industry is facing unprecedented challenges and opportunities. This rapidly changing market environment puts forward higher requirements for international logistics education. The change of international logistics education market demand is not only reflected in the demand for talents, but also in the demand for talents' quality, knowledge structure and practical ability. Therefore, international logistics

education needs to adjust teaching strategies in time to adapt to the changes in market demand.

The changes of international logistics education market demand are mainly manifested in the following aspects: with the expansion of global trade and the rapid development of logistics industry, the demand for logistics talents is increasing, and enterprises need more logistics professionals to support business development; With the transformation and upgrading of the logistics industry, the quality requirements for logistics talents are constantly improving. Enterprises need not only talents with basic logistics knowledge, but also compound talents with innovative thinking, cross-border integration ability and high professionalism. With the continuous innovation and application of logistics technology, the demand for knowledge structure of logistics talents is also changing. Traditional logistics management knowledge can no longer meet the market demand, and logistics talents need a more comprehensive knowledge system, including knowledge in emerging fields such as supply chain management, cross-border e-commerce, logistics finance, etc. Logistics industry is a highly practical industry, which requires high practical ability of logistics talents. Enterprises need logistics talents who have the ability to solve practical problems and can quickly adapt to the working environment and play a role [46].

With the continuous advancement of globalization, the international logistics industry has increasingly become an important part of the global economy, and the demand for logistics talents with international vision and cross-cultural communication skills is becoming more and more urgent. However, at present, many international logistics education courses often pay too much attention to localized teaching contents and cases, but lack in-depth analysis and understanding of the global logistics market, resulting in students' lack of ability to work and solve problems in the international environment.

Many international logistics education courses mainly focus on the domestic logistics market and operation, and lack of in-depth analysis and comparison of the global logistics market, which leads to students' insufficient understanding of the operation rules, international practices and global trends of international logistics, insufficient investment in international exchanges by some educational institutions, and students' lack of opportunities to interact with international counterparts, international enterprises and international

organizations, which limits students' ability to broaden their international horizons and establish international contacts; Some teachers of international logistics education may lack international experience and cross-cultural communication skills, and cannot effectively impart international logistics knowledge. Teachers' international vision and teaching ability are very important to cultivate students' international vision. It is difficult for some educational institutions to obtain the latest educational resources in international logistics, such as international case studies, international databases and international cooperation opportunities, which limits the updating and expansion of teaching content [25].

In a word, international logistics education plays an important role in improving the quality and skills of logistics talents, optimizing supply chain management, promoting international trade and cooperation, promoting the innovative development of logistics industry, cultivating professionals to meet the needs of the industry, promoting the integration of laws and regulations with international standards, strengthening the awareness of environmental protection and sustainable development, and improving customer satisfaction. At the same time, the failure of international logistics education is not inevitable [19]. As long as educational institutions can recognize their own problems and take effective measures to improve them, they can provide better educational services for students and cultivate more outstanding international logistics talents.

The value of the international logistics information industry chain is not high. The international logistics information industry chain is an industrial chain involving the management and organization of goods transportation, storage and distribution processes around the world. The main links of this industrial chain include upstream shippers, international trunk transportation resources, midstream logistics service providers, as well as downstream platforms, e-commerce platforms and individual customers.

The main links of this industrial chain include upstream shippers, international trunk transportation resources, midstream logistics service providers, as well as downstream platforms, e-commerce platforms and individual customers. In the upstream, node resources such as cargo owners are highly concentrated with international trunk transportation resources, providing basic support for international logistics [55].

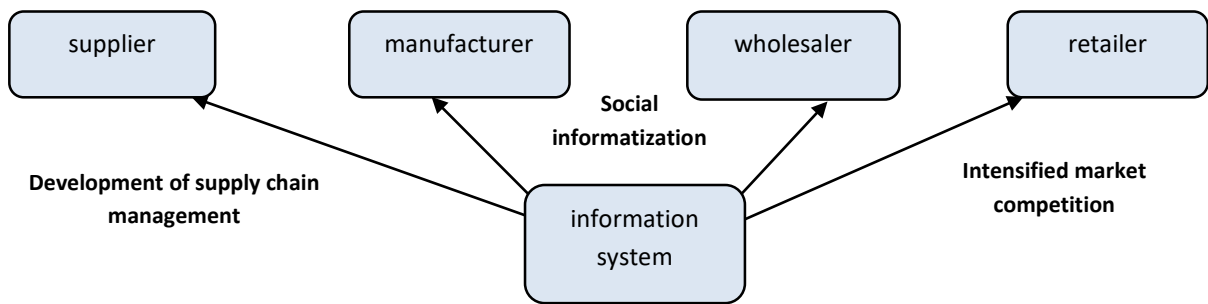


Figure 11 – Background of information system generation [65]

The logistics service providers in the middle reaches are the core of the whole industrial chain. They are responsible for transporting goods from upstream nodes to downstream customers and providing various logistics services, such as transportation, warehousing, packaging, sorting, customs clearance and goods tracking. These service providers may include international logistics companies, freight forwarders and warehousing service providers. Downstream, various platforms, e-commerce platforms and individual customers constitute a huge market demand. With the development of Internet and cross-border e-commerce, the number of individual customers is growing rapidly, and the demand for logistics services is also increasing. At the same time, e-commerce platform also provides more logistics demand and promotes the development of international logistics industry [47].

There are many reasons for the low value of the international logistics information industry chain. Some international logistics enterprises have not fully realized the Internet logistics management system, and lack of advanced bar code technology and GPS logistics positioning and tracking system, which makes the processing, transmission and tracking of logistics information inefficient, increases logistics costs and reduces the value of the industry chain. The information industry chain of international logistics is often at the low end, which is mainly due to the lack of unified information standards and norms and the existence of information islands. This leads to the inability to effectively share and integrate logistics information, which limits the promotion of industrial chain value [26].

The logistics industry is technology-intensive and talent-intensive, and the realization of international logistics requires experienced logistics operation talents and professional IT

(information technology) talents. However, the relative lack of such talents currently limits the development of the logistics information industry chain. The construction of international logistics system often lacks in-depth understanding and analysis of market demand, which leads to the mismatch between the functions provided and the actual demand, which affects the efficiency and quality of logistics services, and then affects the value of the industrial chain. Many traditional logistics enterprises have shortcomings in development planning, basic platform construction, resource integration, specialization and informatization level, which makes them at a disadvantage in international competition, thus limiting the development of the entire logistics information industry chain.

Because international logistics transportation needs to go through a series of complicated procedures such as customs, auditing and identity authentication, the low-end industrial chain will make it impossible for international logistics enterprises to accurately locate product information, which has become an uncontrollable factor. Upstream and downstream cannot be better connected. In case of missing or missing parts, if there is no supervision system, it is difficult to identify which link has gone wrong, and the supervision system is neither easy to adjust nor easy to find.

The low-end information industry chain not only affects products, but also affects the propaganda of international logistics industry. With the improvement of people's awareness and attention to the Internet, the Internet is an important medium to enhance international influence. Without this important propaganda tool, no amount of offline influence will be in vain. Therefore, solving the problem of information industry chain is one of the primary tasks of international logistics [29].

To sum up, the lagging level of international logistics education and the low value of the information industry chain are indeed two major challenges facing the international logistics industry. These two problems not only limit the development speed of the international logistics industry, but also affect its overall competitiveness. The reasons for the lagging level of international logistics education are the lack of pertinence in teaching content, lack of practicality in teaching mode, lack of teachers, rapid changes in market demand and lack of international vision in teaching courses.

The main reasons for the low value of international logistics information industry chain are insufficient informatization level, low standardization of information industry chain, lack of professionals, unclear market demand and low development level of traditional logistics enterprises. In a word, to solve the problems of lagging international logistics education level and low value of information industry chain requires the joint efforts and cooperation of the government, enterprises and educational institutions. By strengthening investment, updating education content and methods, improving informatization level and promoting the implementation of information sharing and coordination, the healthy development of international logistics banks can be promoted.

Chapter 3 Suggestions and countermeasures to promote development of international logistics

3.1 Improve relevant laws and regulations

The definition and importance of international logistics. With the continuous progress of globalization, international logistics activities have become a bridge and link connecting the world economy, and play a vital role in promoting global trade, ensuring the stability of supply chain and promoting economic development. However, the complexity and diversity of this field also make it need strict supervision and supervision. In order to ensure the safety, efficiency and order of logistics activities, a series of conventions on international cargo transportation have been issued. At present, the main existing international conventions on international cargo transportation are CISG/CMR Convention, MC99 Convention and Hamburg Rules. The specific contents are shown in table 6.

Table 6 – Major international conventions on international transport of goods[20]

Name	Effective time	Major objective
CISG	1980	To unify the legal provisions of international sales contracts in various countries, CISG has a wide scope of application, covering the provisions of contract formation, performance and breach of contract.
CMR Convention	1956	Solve the disputes and problems in the international road freight transport contract. The Convention stipulates the carrier's liability, compensation limit, caustic requirements for transporting goods, etc.
MC99 Convention	1999	The Convention defines the responsibilities and obligations of airlines, and stipulates the compensation limits for cargo transportation and the accountability mechanism for airlines.
Hamburg Rules	1978	Mainly for the contract provisions, cargo loss and delay, carrier's responsibility and so on in the carriage of goods by sea.

First of all, international logistics laws and regulations effectively regulate all kinds of activities in the logistics industry by formulating clear codes of conduct and operating procedures. From the loading and unloading, transportation, storage and distribution of

goods, international logistics laws and regulations have made detailed provisions and explanations, ensuring the legitimacy and fairness of logistics activities. These laws and regulations not only restrict the behavior of logistics enterprises and employees, reduce the occurrence of unfair competition and illegal acts, but also help to maintain market order and ensure the healthy development of the logistics industry [48].

Secondly, international logistics laws and regulations play a vital role in protecting the legitimate rights and interests of all parties in logistics activities. In the process of international logistics, laws and regulations of many countries and regions are involved, and all parties including shippers, carriers, insurance companies and customs may face risks and challenges in logistics activities. International logistics laws and regulations provide legal protection by clarifying the rights and obligations of all parties, effectively reducing the occurrence of disputes and losses. This not only helps to maintain the smooth progress of logistics activities, but also helps to promote the trust and cooperation of all parties and promote the sustainable development of the international logistics industry.

In addition, international logistics laws and regulations provide strong support for the smooth progress of international logistics by strengthening international cooperation and coordination. Under the background of globalization, international logistics activities often need to cross many countries and regions, involving many legal systems and regulatory agencies. Therefore, in the process of formulating and implementing international logistics laws and regulations, governments of various countries actively seek cooperation and coordination to jointly promote the development of international logistics industry. This not only improves the logistics efficiency and reduces the logistics cost, but also helps to promote the prosperity and development of global trade.

In addition, international logistics laws and regulations also pay attention to the sustainable development of logistics industry and environmental protection. The global environmental problem is becoming more and more serious, and the global carbon dioxide emissions from international shipping are increasing year by year, with an increase of nearly 100 million metric tons from 2012 to 2022, as shown in figure 12 below. In 2022, global distribution also accounts for a very large proportion of carbon dioxide emissions generated by the global transportation sector, reaching 10%, as shown in figure 13 below.

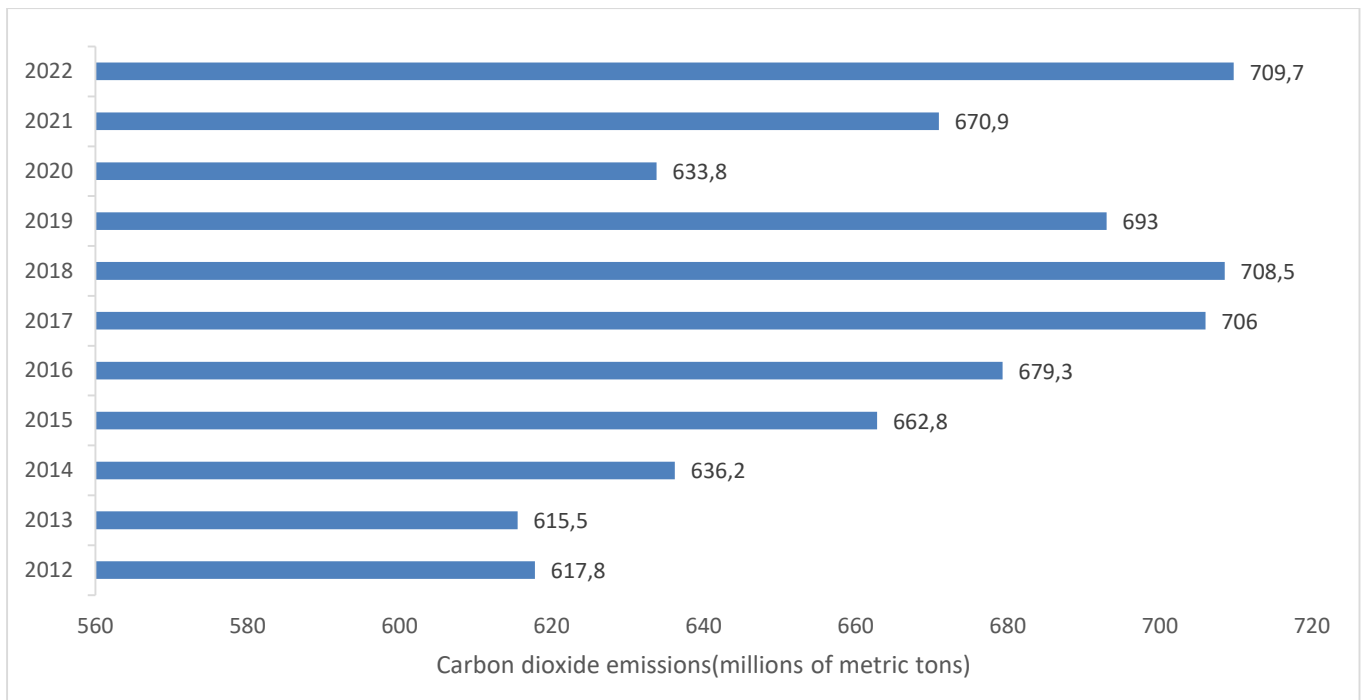


Figure 12 – Global CO2 Emissions from International Shipping in 2012–2022 [30]

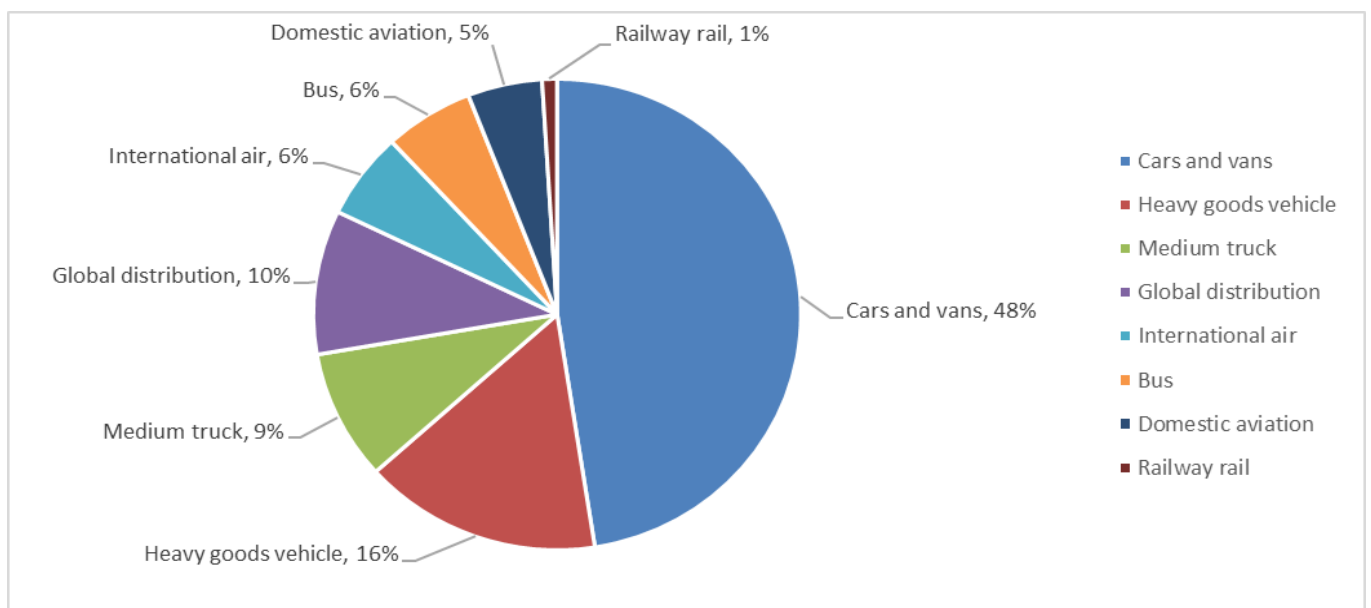


Figure 13 – Distribution of Carbon Dioxide Emissions Produced by Global Transportation Sectors in 2022 [63]

Therefore, as one of the main sources of energy consumption and emissions, the international logistics industry is also facing enormous environmental pressure. Therefore, international logistics laws and regulations should not only regulate logistics activities, but also emphasize environmental protection and sustainable development. These regulations

should require logistics enterprises and employees to take environmental protection measures in logistics activities, reduce energy consumption and emissions, and promote the green and sustainable development of the logistics industry [67].

In a word, the definition and importance of international logistics laws and regulations are of vital significance to the healthy development of the global logistics industry. These laws and regulations provide a solid legal guarantee for the healthy development of the global logistics industry by standardizing logistics activities, protecting the legitimate rights and interests of interested parties, promoting international cooperation and coordination, and paying attention to environmental protection. In the future, with the deepening of globalization and trade liberalization, the international logistics industry will face more opportunities and challenges. Therefore, governments and enterprises need to further strengthen the formulation and implementation of international logistics laws and regulations, constantly improve and optimize the relevant laws and regulations system, improve the standardization and standardization level of the logistics industry, and promote the sustainable development and progress of the global logistics industry. At the same time, it is necessary to strengthen the training and education of logistics enterprises and employees, improve their legal awareness and compliance awareness, and ensure that they can strictly abide by relevant laws and regulations in international logistics activities. In addition, governments of all countries need to strengthen international cooperation and coordination to jointly cope with the challenges and problems faced by the international logistics industry and promote the healthy development of the global logistics industry [13].

The development of international logistics laws and regulations is a thick chapter in the history of the continuous evolution of global economy and trade. Tracing back to the beginning of the 20th century, with the increasingly frequent international exchanges, international logistics laws and regulations began to brew, and its core focus was mainly on the fields of maritime and air cargo transportation. During this period, the promulgation of landmark laws and regulations, such as The Hague Rules and Warsaw Convention, laid a preliminary legal foundation for international logistics activities and provided clear rules and guidelines. These laws and regulations not only provided legal guarantee for the smooth

operation of international trade at that time, but also injected impetus into the initial development of international logistics.

With the passage of time, the process of global economic integration has been accelerating, and the scale and frequency of international trade have increased significantly. This change has prompted the international logistics laws and regulations to continuously expand the coverage, including railways, highways and other modes of transportation into its normative scope [70]. At this stage, the international logistics laws and regulations system is gradually improved, which not only provides legal guarantee for the coordinated operation of various modes of transportation, but also lays a solid foundation for the rapid development of the international logistics industry.

In the 21st century, international logistics laws and regulations are facing unprecedented challenges and opportunities. The rapid development of e-commerce and the growing awareness of global environmental protection put forward new requirements for international logistics laws and regulations. In this context, international logistics laws and regulations need to keep pace with the times, constantly update and improve to adapt to the new trend of globalization, informatization and sustainable development. The rise of e-commerce has brought new development opportunities to the international logistics industry, but it also poses new challenges to its laws and regulations. Facing the new format of e-commerce, the traditional logistics laws and regulations system is stretched. Therefore, it is necessary to constantly innovate international logistics laws and regulations, bring e-commerce into its normative scope, and ensure the standardized and orderly development of logistics activities under e-commerce within the legal framework.

In a word, the development of international logistics laws and regulations is an evolutionary history that constantly adapts to the needs of global economic and trade development. Facing new challenges and opportunities, the international logistics industry needs to continuously strengthen cooperation and exchanges, strengthen self-supervision and regulation, and actively respond to new challenges, so as to promote the perfection and development of international logistics laws and regulations and provide solid legal support for the sustainable development of the international logistics industry. Only in this way can the international logistics industry be in an invincible position in the tide of globalization

and sustainable development and make greater contributions to the prosperity of global economy and trade [39].

Challenges faced by international logistics laws and regulations. As an important part of global trade, the perfection of international logistics laws and regulations directly affects the stability and efficiency of global supply chain. However, the current international logistics laws and regulations are facing many challenges, which come from the differences of national legal systems, the diversity and complexity of logistics links, the rapid development of technology and the fluctuation of international political situation [4].

First of all, due to the significant differences in legal systems, legal systems and practices among countries, international logistics often faces the risk of legal conflicts in key links such as cross-border transportation, goods delivery and dispute settlement. This kind of conflict may not only lead to the increase of logistics cost, but also lead to time delay and efficiency decline, and even lead to the seizure or confiscation of goods. Therefore, countries need to establish closer communication and consultation mechanisms to achieve legal coordination and cooperation in the field of logistics, while safeguarding their respective legal sovereignty.

Secondly, international logistics involves many links and countries, and it is difficult to supervise. This involves not only the transportation, storage, loading and unloading of goods, but also the laws, regulations and regulatory requirements of different countries. Therefore, it is urgent to establish an efficient and transparent international logistics supervision system and strengthen supervision cooperation and information sharing among countries. At the same time, for logistics enterprises, it is also necessary to constantly improve their compliance awareness and ability to ensure stable operation in a complex international logistics environment.

With the continuous development and application of logistics technology, international logistics laws and regulations also need to keep pace with the times. The application of Internet of Things, big data, artificial intelligence and other technologies has brought unprecedented opportunities and challenges to international logistics. The application of these technologies can not only improve the efficiency and transparency of logistics, but also provide more accurate market analysis and forecast for logistics

enterprises. However, this also puts forward higher requirements for international logistics laws and regulations. How to ensure the legal use of these new technologies and prevent them from being used for illegal activities has become a common problem faced by governments and international organizations.

At the same time, the perfection of international logistics laws and regulations is also influenced by the international political situation. Trade protectionism, geopolitical risks and other factors may affect the stability and implementation effect of international logistics laws and regulations. For example, trade protectionism may lead to an increase in trade barriers and make international logistics more complicated and difficult; Geopolitical risks may lead to the interruption and instability of logistics channels and bring huge losses to international logistics. Therefore, governments and international organizations need to pay close attention to the changes in the international political situation and adjust and improve relevant laws and regulations in time to cope with possible risks and challenges [66].

To sum up, countries need to strengthen cooperation and coordination to jointly promote the formulation and improvement of international logistics laws and regulations. This includes but is not limited to the following aspects: first, strengthen the formulation and implementation of international logistics legal standards, and promote the coordination and unification of legal systems, legal rules and legal practices in various countries; Second, strengthen supervision cooperation and information sharing to build an efficient and transparent international logistics supervision system; The third is to promote technological innovation and compliance application, and promote the wide application of new technologies in the field of international logistics; Fourth, pay attention to the changes in the international political situation. In order to solve the differences in laws, policies and business environment among countries, it is necessary to establish a unified system of international logistics laws and regulations.

Through cooperation between international organizations and government agencies, we can formulate universally binding international logistics laws and standards and promote coordination and cooperation among countries. Cross-border logistics is an important part of international logistics, so it is necessary to strengthen the supervision and management of cross-border logistics. The government should establish a cross-border logistics

supervision mechanism, strengthen the supervision and management of cross-border logistics enterprises, improve the level and quality of the whole industry, and at the same time, strengthen the security of cross-border logistics and reduce potential risks. The government should speed up the formulation of relevant laws and regulations, clarify the rights and obligations in the field of cross-border logistics, protect the rights and interests of enterprises and consumers, and at the same time, strengthen the supervision and management of cross-border logistics enterprises, standardize market order, and prevent unfair competition and illegal acts. International cooperation is an important way to improve international logistics laws and regulations [56].

The government should actively promote international cooperation, strengthen cooperation with other countries and regions, and jointly formulate cross-border logistics standards and rules. This can promote the coordinated development of the international logistics industry and improve the overall competitiveness. Perfecting international logistics laws and regulations is an important guarantee to promote the healthy development of international logistics industry. The government should strengthen supervision and management, formulate relevant laws and regulations, promote international cooperation and train professionals to promote the sustainable development of the international logistics industry. At the same time, countries should strengthen coordination and cooperation to jointly address the challenges and problems in the global logistics field and promote the prosperity and development of the global economy.

3.2 Improve the degree of international logistics informatization in different regions

The application of information technology in international logistics status quo. The price of world trade keeps rising. If an enterprise wants to prosper, it must regard the whole world as its own stage. Product or process innovation is not just a state monopoly. Global companies can use excellent product and process innovation anywhere in the world. These companies have established R&D centers around the world to gain the benefits of local talents. For example, Ford took the lead in introducing escort models into the concept of

"world cars". Every part of this model is produced in one place and then distributed to assembly lines around the world by using local expertise. In every market, cars can be assembled according to the tastes of local people. Organizing the integration of manufacturing and logistics in this way is helpful for enterprises to greatly shorten the cycle time of product launch, but success in this environment is inseparable from international logistics [3].

All the complexities we see in global logistics lead to the need for active coordination within the company and between different functional departments in order to succeed in the market. The traditional wisdom of concentration and export adopted by many multinational companies is gradually giving way to geographically dispersed activities, which are interrelated in a very important way. These contacts include coordinating R&D activities, engaging in transcontinental product design, establishing network factories around the world, purchasing raw materials, spare parts and finished products around the world, distributing finished products around the world, and most importantly, maintaining effective communication between employees of different cultures. Coordinating these interrelated and complex activities is an important part of global business success, and information systems can just solve these problems.

Information technology is the driving force of the new economic tide and the material and technical basis of enterprise informatization. With the rapid development of information technology, there are various ways to realize its innovation. In the formation and diffusion of new information technology, it can be generally divided into technical leaders, technical followers and technical latecomers. Logistics information technology is the application of modern scientific and technological means in the process of logistics operation and forms a comprehensive application. It is also the symbol of modern logistics informatization and the key point that distinguishes it from traditional logistics. The application technology of information technology in logistics system mainly includes automatic identification and collection technology, information storage and processing technology, information exchange technology, logistics dynamic tracking technology, network service technology and so on [23].

EDI technology is widely used in international logistics. EDI is the abbreviation of "Electronic Data Interchange", which is called "paperless trade or electronic data interchange". EDI has been applied in finance, insurance and commodity inspection, foreign trade, customs clearance and declaration, taxation, manufacturing, transportation and warehousing related to international logistics. EDI relies on big data network to connect economic related information with certain characteristics and structures according to agreements, so that different partners can exchange data through computer networks. The development of EDI technology has realized paperless trade; The speed and quality of information transmission have been greatly accelerated; Structured data language to improve work efficiency and competitiveness; The data exchange with recognized standards improves the communication efficiency between trading partners. EDI's message reception mainly adopts international message format, so partners should also receive and process messages according to international data reception format, laying a foundation for cooperation. EDI system consists of EDI client system and EDI transmission system, in which the client system includes EDI application system and format conversion system, and the transmission system includes computer communication network and EDI exchange platform, as shown in figure 14.

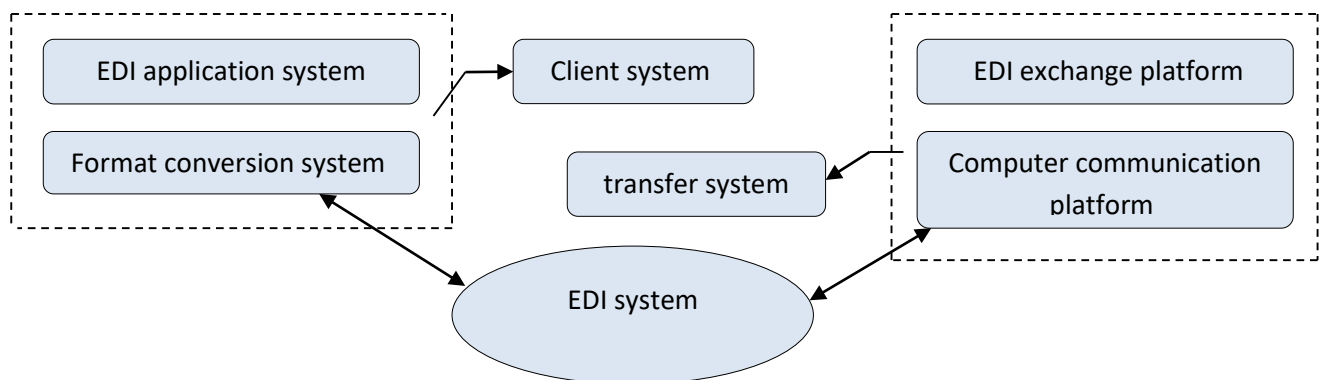


Figure 14 – Schematic diagram of EDI system [11]

With the increasing frequency of international trade and the increasing demand for logistics, the application of bar code technology in the field of international logistics has become increasingly important, and it has gradually become an indispensable part of the international logistics system with its advantages of high efficiency, accuracy and low cost.

Bar code is a graph composed of a group of alternating bars and spaces with different thicknesses. The data composed of these bars and spaces express certain information, which can be read by photoelectric scanning and reading equipment and realize the special code of data input into the computer. [8] Its characteristics are fast input speed, high reliability, large amount of collected information, flexibility and practicality. There are three commonly used and recognized logistics barcodes in the world: ITF-14 barcode, UCC/EAN-128 barcode and EAN-13 barcode (table 7).

Table 7 – Internationally recognized logistics bar code [18]

Name	Magnification coefficient range	Code type	digit capacity	Mark goods
ITF-14	0.625-1.200	Continuous, fixed length	14	Non-retail goods
UCC/EAN-128	0.25-1.00	Continuous, non-fixed length	128	Goods with additional attributes
EAN-13	0.80-2.00	Continuous, fixed length	13	Barcode protocols and standards for general end products

The barcode of RFID technology can store large-capacity data and modify information conveniently, which is a technological revolution of logistics operation. RFID is the abbreviation of "radio frequency identification", which is called radio frequency identification technology. RFID is a non-contact automatic identification technology, which mainly scans the target with radio frequency signals to obtain data information without manual intervention. The wireless characteristics of RFID technology bar code make it waterproof, high temperature resistant and diamagnetic, and it can read data even if the distance is far enough [51]. The application of RFID technology makes it easy to read, fast to identify, large in data capacity, long in service life, wide in application range, dynamic in tag data, better in security and capable of realizing dynamic real-time communication.

In recent years, with the acceleration of globalization and the rapid development of e-commerce, the international logistics industry is facing great challenges and opportunities [34]. With its powerful geospatial information processing ability, GIS technology has gradually shown its importance and application value in the international logistics field.

Geographic Information System (GIS for short) is a system for dynamic analysis of geospatial data by using geographic model, which mainly solves the spatial problem of data receiving and processing. The development of GIS is a comprehensive scientific system combining geography, surveying, cartography and computer science, which can effectively collect, store and display spatial data, and complete a series of work by free editing, analysis and output. The basic function of GIS is to convert table data into geographic graphics, and then browse, operate and analyze the display results. The display range can range from intercontinental maps to very detailed block maps, and the display objects include daily population, sales, transportation routes and so on.

With the acceleration of globalization, the international logistics industry is facing unprecedented challenges, and the timeliness, accuracy and cost-effectiveness of cargo transportation have become the focus of the industry. Under this background, the introduction of global positioning system technology has brought new development opportunities to the international logistics industry. GPS is the abbreviation of Global Positioning System. Its function is to use navigation satellites for timing, positioning and ranging [24]. The use strategy of GPS is charging strategy and system accuracy strategy. It is characterized by global and all-weather work; High positioning accuracy; Multifunctional and widely used. The global positioning system in international logistics is mainly used for automatic positioning, tracking and scheduling and land rescue; Used to determine the best voyage and safe route of inland river and ocean fleet, real-time dispatching, monitoring and water rescue route; Used for air traffic management, precise approach and landing, route navigation and surveillance; Used for railway transportation management; Used in military logistics.

The importance of the application of information technology in international logistics system. In order to provide the best logistics service, logistics enterprises must have a good information processing and transmission system, and the implementation of logistics system informatization can greatly accelerate the speed of logistics distribution. At present, the survival and benefit improvement of logistics enterprises largely depend on the level of information technology.

How to optimize the allocation of resources, how to manage and make decisions, and how to get the maximum benefit at the lowest cost is one of the important problems faced by logistics enterprises. In logistics management and decision-making, it is necessary to analyze all kinds of information in real time, give the best form in the shortest time, and need optimization or intelligent planning, such as delivery, packaging, transportation resources and transportation route selection. Through the implementation of contemporary information technology, the information generated in the logistics process is collected, classified, transmitted, summarized, identified, tracked and inquired, so as to realize systematization, networking and integration, effectively allocate resources and obtain maximum effect and profit at the lowest cost [65].

The operation of logistics enterprises depends on various processes, and each operation step and connection takes time to complete the standard tasks. Saving process time can bring more value to customers, help improve the market response ability of logistics enterprises and strengthen their core competitiveness. Use advanced information technology to integrate the business process of logistics system, and comprehensively handle the whole warehouse in terms of warehouse management, order processing, loading and unloading and distribution. Through the transportation application and cost management of logistics information system, cost consumption can be reduced and the competitive advantage of logistics enterprises can be established.

Logistics information system provides intelligent decision-making function, which can comprehensively and objectively quantify the operating performance of logistics enterprises, divide the undertakings and elements of logistics enterprises, and cover all aspects of logistics enterprises. In-depth evaluation, formulate very detailed quantitative indicators, take the overall logistics enterprise as the analysis basis, and provide suggestions for future improvement. For example, when dealing with the market quickly, there must be a rapid logistics decision-making system. Logistics information system can provide timely and accurate data, and use scientific and systematic analysis methods to enable managers to choose some executable programs [2]. In this way, the decision-making of logistics enterprises will become faster, more accurate and more scientific.

In order to improve competitiveness, logistics enterprises must use modern information technology to realize the unity of management science and technology. Realizing informatization is helpful for logistics enterprises to expand their business space quickly and make up for the shortage of enterprise resources. In addition, the application of information technology and information system will strengthen the internal management function of logistics enterprises, fully mobilize the enthusiasm of employees and stimulate their subjective initiative. At the same time, the information technology of logistics enterprises can effectively integrate the organizational structure of enterprises, trigger the reform of management mechanism and the reorganization of business processes of logistics enterprises, and make all departments closely linked with enterprise objectives and information transmission methods. In recent years, various emerging logistics management information systems have emerged, such as popular mobile e-commerce, integrated management platform, virtual software leasing, intelligent business intelligence system and so on. Applying these systems to enterprises will greatly improve the efficiency of logistics management and operation, reduce logistics costs and meet the rapid response needs of customers [34].

To sum up, combined with the current situation of information technology application in international logistics and the importance of information technology application in international logistics system, it provides some feasible strategic analysis for the development of international logistics informatization:

Enterprises should fully understand the details of international and domestic logistics development trends and deal with traffic factors accordingly. First of all, it can expand the traffic passage and transportation scope, and improve the efficiency and quality of manual work. Then we should strengthen supply chain management according to international demand, establish multiple transmission stations and distribution points to improve the current situation of logistics industry, classify and integrate logistics and transportation business, and deliver goods in a fast and efficient way. To speed up the development and construction of international logistics, we must strengthen the operation of cross-border transportation, link logistics channels in different regions, and ensure the quality and efficiency of international freight services. When operating in different areas, it is necessary

to distinguish priorities, formulate scientific transportation plans, strengthen the timeliness management of logistics in some remote areas, improve the quality of distribution, and build perfect transportation conditions and infrastructure. Logistics is the core part of supply chain and the foundation of supply chain stability. In order to ensure the stability of the supply chain, it is also necessary to understand the basis of logistics [26].

Only by deeply understanding the essence of logistics can we design an effective and flexible supply chain system, enhance the ability to cope with uncertain factors and ensure the sustainable development of commercial entities.

In view of the current shortage of human resources in the international logistics industry, enterprises should recruit professional logistics talents from all aspects to expand the ranks of the logistics industry. Each enterprise can select, evaluate, grade and examine its internal employees, and regularly train their professional abilities to improve their professional quality. In order to ensure the smooth progress of the whole logistics process, employees of all departments must show their professional qualities, ensure the safe and efficient delivery of goods, provide quality transportation services for customers and promote the operation of logistics informatization. Enterprises can also establish and improve the internal management system, optimize the management mode of logistics talents, improve the responsibility system of rewards and punishments, incorporate the performance and work performance of employees into the evaluation system, stimulate the enthusiasm of enterprises, and improve the professional level of internal personnel, so as to cultivate high-quality logistics management talents and service talents for enterprises [40].

While promoting the construction of logistics informatization, we should also establish innovative ideas, grasp the application of new technologies and equipment in time, keep pace with the times, keep up with the world situation, cater to the changes of international development trends, and make adjustments and optimizations at any time.

The essence of logistics lies in the integration of goods flow, information flow and cash flow. Deliver the right goods to customers at the right time, at the right place, at the right price, in the right quantity and in the right state, and carry out efficient logistics and transportation. Increase investment in assets, improve the international service network, build a logistics management system, and take cargo flow as the logistics foundation. Once

there is a problem with the goods flow, it will directly affect the logistics system and then affect the stability of the supply chain. Follow up the real-time status information of goods, track the transportation situation and make correct business decisions to ensure the stability of the supply chain. Strengthen the visualization of logistics information and improve the efficiency of logistics system. It is necessary to quantify the cash flow value of logistics as much as possible in order to gain a clear understanding and assist reasonable business decisions. The cash flow evaluation of logistics should consider the direct logistics cost, in-transit inventory cost, safety inventory cost, potential unsalable cost, possible out-of-stock opportunity cost and financing cost [51].

Different business entities can quantify and evaluate the cash flow value of their logistics systems according to their own industry characteristics, commodity characteristics and different data models. The evaluation of logistics cash flow value is an extremely complicated process, which needs a lot of logistics information flow data as the basis, supplemented by a deep understanding and understanding of industry and commodity characteristics. In the development of modern logistics industry, we should actively introduce modern information technology, strengthen the contact with international logistics, attach importance to the development of practical information technology, rectify online shopping software at home and abroad, and correctly use electronic network equipment to facilitate the international logistics industry, thus promoting the integrated development of international logistics information.

Under the guidance of system engineering, the development of international logistics information system relies on science and technology to realize the integration of resources and the optimization of logistics operation. Informatization, standardization and standardization are the keys to the construction of international logistics information system, which can realize information sharing between different borders, improve the efficiency of information connection in logistics system, and make the dissemination and reception of information more convenient and accurate. Relying on scientific and technological means and logistics facilities, the international logistics information system forms a large-scale and full-coverage logistics network, and expands economic benefits through the participation of warehousing and transportation. Therefore, the international logistics information system

contributes to the development of the international logistics industry, and on the basis of resource sharing, countries learn from each other's logistics operation experience, and then intensify the reform of the logistics industry, and finally realize the networking and enrichment of the logistics industry.

3.3 Improve the professional logistics personnel training system

Professional application-oriented international logistics personnel knowledge structure requirements. With the deepening of globalization and the booming of cross-border e-commerce, the international logistics industry is facing unprecedented opportunities and challenges. As a bridge connecting the global market, international logistics plays an important role in promoting international trade and promoting economic development. However, the current international logistics industry is facing problems such as talent shortage and uneven quality, which restricts the healthy development of the industry. Therefore, it is of great significance to cultivate international logistics talents with high quality and application ability to promote the sustained and healthy development of the international logistics industry [69].

However, the logistics industry needs talents with both theoretical knowledge and practical experience. A qualified logistics talent should have the following basic knowledge, and constantly learn according to the needs in practice to improve the knowledge structure. Figure 15 is the knowledge structure requirement diagram of applied international logistics talents, which reflects the current requirements of applied international logistics talents on international logistics knowledge, and mainly includes two sections: core business knowledge and basic business knowledge.

Core business knowledge mainly includes international trade knowledge, port supervision knowledge, international cargo transportation knowledge and information processing and storage and packaging knowledge. With the deepening of international logistics integration, the integration of domestic market and international market is getting closer and closer, so it will be the general trend for foreign-funded enterprises to "come in" and domestic enterprises to "go out".

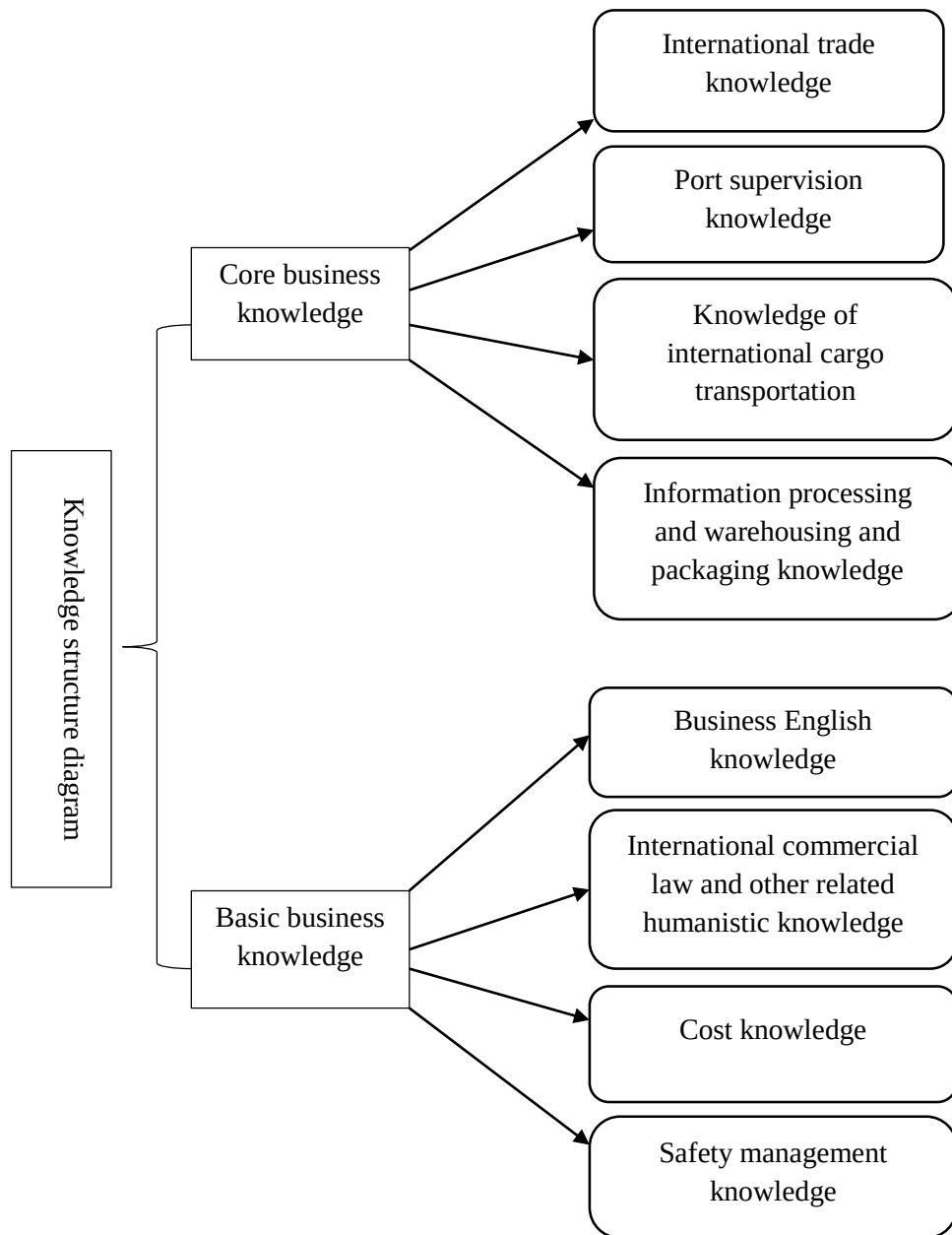


Figure 15 – Knowledge structure requirements of applied international logistics talents [21]

Most of these enterprises are multinational large enterprises, and their businesses are scattered in different countries and regions. In order to reduce production costs and operational risks, their procurement and marketing methods are transferred to real-time, networked and zero-inventory.

Therefore, employees of logistics enterprises need to master the relevant. Only by fully understanding the relevant policies and regulations, operation procedures and document requirements of port supervision can we formulate a reasonable and feasible

logistics plan and an effective cost budget to ensure the smooth and efficient implementation of logistics operations. The business of comprehensive logistics enterprises usually involves a variety of modes and means of transportation, and the implementation level of multimodal transport is also one of the indicators to measure the comprehensive ability of enterprises. Only by mastering the knowledge of using a variety of means of transportation, it is possible to design a feasible, safe, fast and economical transportation scheme and provide customers with appropriate logistics services. Logistics talents are required to be able to collect, sort out and integrate logistics information, to develop and maintain logistics information systems, to develop embedded applications of logistics equipment, to be skilled in receiving and packaging goods, to make effective use of hardware facilities, to reasonably control inventory and other value-added services, to plan, plan, design and optimize logistics systems, and to analyze and solve logistics operation problems [70].

Basic business knowledge mainly includes business English knowledge, international business law and other related humanistic knowledge, cost knowledge and safety management knowledge. In international trade and other business activities, foreign languages are used more and more frequently, especially English, as a common language of international business, is widely used in all fields of logistics activities, from business negotiation and contract signing to daily communication and document writing. The logistics industry is a service industry, and both the supply and demand sides of logistics services usually define their rights and obligations in the form of written contracts. Therefore, it is necessary to understand the laws, regulations, humanities and customs related to the international logistics industry, such as international commercial law, and use this knowledge flexibly and accurately when signing and executing contracts. Logistics services often involve multiple operation links, and various types of expenses occur. Some are the costs of logistics enterprises, and some are external expenses. We should not only know the reasons, types and quantities of activity-based expenses, but also have the ability to conduct activity-based cost analysis. Only through careful cost accounting and analysis can we propose targeted and convincing reasonable solutions that are easy for customers to accept. Logistics enterprises are in the middle of the supply chain, and potential safety hazards are everywhere in the process of operation. The impact of safety accidents will

spread to the upstream and downstream links, causing a series of problems, such as delivery delay, ship schedule (flight) delay, overtime work of personnel, production line shutdown and so on. The final loss caused by a seemingly small accident will be incalculable.[61]

Big data era of international logistics personnel training problems. Although the application of big data in the field of logistics is more and more extensive, many people's literacy in big data is still not comprehensive enough. They may lack an in-depth understanding of big data technologies and tools and cannot fully grasp the potential and application scenarios of big data. In addition, they may lack the ability of data analysis and processing, and cannot effectively use big data to solve practical logistics problems.

The application of big data needs the support of practice and project experience, but many people lack opportunities in the practice of big data. They may not be able to access real large data sets and apply what they have learned in practical projects. Lack of practical opportunities and project experience will limit the international logistics professionals' understanding and ability development of big data applications.

In the field of international logistics, the ability of cross-cultural communication and cooperation is very important. However, many people have shortcomings in international vision and cross-cultural communication ability. They lack the opportunity to understand the development of international logistics, and it is also difficult to understand the logistics environment and challenges of different countries and regions [44]. At the same time, they also lack the skills and experience of cross-cultural communication and cooperation.

To sum up, with the continuous development of big data technology, the demand for talents in the international logistics industry is constantly changing. Combining the knowledge structure requirements of international logistics talents and the problems faced by international logistics talents training in the era of big data, some training strategies are provided to improve the international logistics talents training system:

In order to meet the needs of the industry, it is necessary to clarify the training objectives related to big data. These goals should include mastering the basic concepts, application scope and development trend of big data technology, and being able to use big data technology to analyze and solve practical problems. Defining these goals can provide a clearer learning direction for industry personnel and help them better adapt to the

development of the industry. Secondly, in the era of big data, data has become a new resource. For the international logistics industry, it is very necessary to improve the big data literacy of international logistics talents. We can improve the big data literacy of international logistics talents by setting up relevant training programs, organizing practical projects and participating in academic exchanges. In terms of training programs, courses such as data mining, data analysis and data visualization can be offered to help professionals master the basic knowledge and skills of big data technology [58].

In addition, with the continuous development and evolution of big data technology, logistics personnel should constantly learn and update their knowledge, pay attention to the latest big data technology and application trends, participate in relevant training and seminars, and constantly improve their professional quality. The international logistics industry can provide relevant resources and platforms to help relevant personnel learn and communicate.

The training of international logistics talents needs to improve the ability of data analysis in order to cope with the complicated and changeable market environment and transportation demand. The data involved in the field of international logistics is not only huge in scale, but also complicated in variety. From the quantity of goods, transportation time and destination, to the type and value of goods and the specific needs of customers, these information constitute the data that needs to be processed and analyzed in international logistics. In addition, international logistics also involves customs, taxation and international trade rules, which also need corresponding data analysis and processing. Therefore, data analysis ability plays an extremely important role in the field of international logistics [71].

In order to improve the data analysis ability of international logistics talents, enterprises need to take a series of effective measures. Enterprises need to establish a perfect training system for data analysis to ensure that employees have a solid foundation for data processing and analysis, which includes training contents in statistics, data analysis tools and data visualization. Through systematic training, employees can master the basic methods of data processing and analysis and lay a foundation for subsequent practical work. Secondly, the introduction of advanced data analysis tools is also the key to improve the

data analysis ability of international logistics talents. With the development of technology, various advanced data analysis tools are constantly emerging, such as data mining software and artificial intelligence algorithms. By using these tools, employees can process and analyze data more effectively and improve work efficiency and accuracy. In addition, it is also very important to cultivate talents' awareness of data-driven decision-making. In the era of big data, data becomes an important basis for decision-making. For example, when planning a new route, the company will collect historical transportation data and market information, use data analysis tools for analysis, and formulate the best route planning scheme according to the analysis results.

In the era of big data, the development of international logistics industry presents a vertical segmentation trend. Because international logistics business involves a wide range of fields, including air transportation, sea transportation, land transportation, railway transportation and other links, as well as warehousing, distribution, packaging, information management, etc. it is necessary to set up a vertically subdivided talent training model for different fields and links [43].

Vertical subdivision talent training mode refers to making special talent training plans for different fields and links of international logistics industry to better meet the development needs of specific fields. Take air transportation as an example. With the development of digital technology, the air transport industry is gradually realizing digital transformation. Therefore, international logistics enterprises need to cultivate air transport talents with digital logistics knowledge and skills. Through cooperation with universities and research institutions, we will jointly carry out research and training in digital logistics to improve employees' understanding and application ability of digital technology. For example, employees need to know how to use digital tools to operate and manage flight plan management, cargo tracking, data analysis and so on. This will help to improve the operational efficiency and service quality of enterprises and adapt to the development needs of the digital age. Warehousing is an important part of international logistics. Warehousing involves the storage, storage, sorting and distribution of goods, which requires employees to have rich experience and skills in warehousing management. For example, by using Internet of Things technology and sensor equipment, employees can monitor the status and

location of goods in real time to ensure the safe and accurate delivery of goods. At the same time, using big data analysis and artificial intelligence technology, employees can analyze and mine massive logistics data, provide valuable insights and forecasts, help enterprises optimize logistics operations, reduce transportation costs and improve customer satisfaction [28].

In the era of big data, the development of international logistics industry presents the trend of globalization and integration. In order to better cope with this development trend, international logistics enterprises need to strengthen international cooperation and exchanges and expand the international vision of logistics talents. Therefore, international logistics enterprises need to actively participate in international cooperation projects and cooperate with foreign logistics enterprises, research institutions and universities to jointly carry out research and development, personnel training and business development in the logistics field [3].

This can not only introduce advanced logistics technology and experience, but also promote exchanges and cooperation between enterprises and enhance their international competitiveness. Enterprises can send employees to foreign advanced enterprises to learn and communicate, understand the operation mode, management concept and technology application of foreign enterprises, and enhance the international vision and comprehensive quality of employees. In addition, international logistics enterprises need to pay attention to the construction and promotion of international logistics standards, and participate in the formulation of international logistics standards, which can improve the visibility and influence of enterprises and win more cooperation opportunities for enterprises. At the same time, following international logistics standards can improve the standardization level of enterprises, improve operational efficiency and service quality. By strengthening international cooperation and exchanges and expanding the international vision of logistics talents, international logistics enterprises can better adapt to the development needs of globalization and enhance their competitiveness and innovation ability. This will help enterprises achieve greater success in the international logistics market and contribute to the stability and prosperity of the global supply chain.

Conclusion

Logistics is the process of transporting goods from the place of production to the place of consumption, involving many links such as goods transportation, pig storage, packaging, information flow and so on. International trade needs to cross national boundaries, and the efficient operation of international logistics system provides the basic guarantee for this cross-border trade. With the development of logistics network, goods can cross the world quickly and safely to meet the market demand. The perfection of logistics infrastructure, the advanced means of transportation and the innovation of logistics management have jointly provided important support for the smooth progress of international trade. In today's international environment, the study of international logistics is indispensable. In this paper, three chapters are written, and the current situation and development trend of international logistics are deeply studied and analyzed.

The first chapter is an overview of international logistics, which is mainly divided into three parts. The first part defines the concept of international logistics, that is, international logistics is the planning, implementation, control and management process of cross-border material flow and storage, which can be mainly divided into maritime logistics, air logistics, land logistics and multimodal transport.

The second part describes the characteristics of international logistics. As an important support of global economic integration and trade liberalization, international logistics involves cross-border cargo transportation, warehousing, loading and unloading, packaging, distribution and information management.

With the continuous development of global trade, the importance of international logistics in modern economy is increasingly prominent. However, there are significant differences in political and economic systems, market size, technical level and cultural background between most countries and regions. Under the joint action of these factors, the international logistics system has formed the complex characteristics of different logistics environments, wide range of logistics systems, international logistics must be supported by international information systems, and high requirements for standardization of international logistics.

The third part describes the main subsystems of the international logistics system, namely, transportation subsystem, warehouse subsystem, international logistics commodity inspection subsystem, international logistics commodity packaging subsystem and international logistics information subsystem.

The second chapter is a further analysis of the problems existing in international trade logistics. International logistics is a gold industry under the new situation and one of the industries with the most development potential. The traditional offline real economy has been gradually replaced, and the Internet economy has become a popular product all over the world. The formation and rapid development of international logistics industry has opened up a brand-new situation under the new situation.

The scale of logistics system is expanding day by day, and its functions are unprecedented. The Internet of Things and big data are gradually deeply integrated with the logistics industry and become a new force driving social development and progress. However, due to the complexity of the international logistics environment, there are still some thorny problems in the international logistics industry, such as the relatively low-end information industry chain, low awareness, lack of international logistics professionals and imperfect infrastructure construction.

The third chapter is suggestions and countermeasures on how to promote the development of international logistics. The first strategy is to improve the laws and regulations related to international logistics. With the continuous advancement of globalization, international logistics plays a vital role in promoting global trade, promoting economic development and ensuring global economic connection. However, effective laws and regulations can escort the normal operation of international logistics.

Only by formulating clear laws and regulations can we effectively regulate various activities in the industry, thus ensuring the healthy development of international logistics. The second strategy is to improve the degree of international logistics informatization in different regions. In order to provide the best logistics service, logistics enterprises must have a good information processing and transmission system. The implementation of logistics system informatization can greatly accelerate the speed of logistics distribution, and the survival and benefit improvement of logistics enterprises also depend on the level

of information technology to a great extent. Each country can improve its own degree of international logistics informatization by improving basic international transportation equipment, strengthening professional training of employees and establishing third-rate comprehensive information management.

The third strategy is to improve the training system of professional logistics talents. With the deepening of globalization, the demand for professional talents in cross-border logistics industry is increasing. These talents need to have professional knowledge in international trade, customs regulations, international transportation, logistics management and so on, so as to ensure the safe, fast and efficient delivery of goods. Under this international situation, we can cultivate international logistics talents with higher quality and ability by defining training objectives, improving data analysis ability, establishing vertical segmentation talent training mode, and strengthening international cooperation and exchange to expand the international vision of logistics talents.

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