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Research on Basic Industry and Logistics Supply Chain Systems in India: Challenges, Opportunities and Development Strategies

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Abstract

This article discusses the challenges and opportunities of basic industry and logistics supply chain systems in India and suggests development strategies to address these issues. The study provides a comprehensive overview of the Indian industry, including its manufacturing sector and logistics infrastructure, and examines the challenges faced by the industry, such as transport network issues, supply chain inefficiencies and coordination problems among stakeholders. Despite these challenges, the study highlights the opportunities for growth in India's logistics sector, including the potential for technological advances and government initiatives to improve infrastructure. Finally, the study suggests strategies for developing a logistics supply chain system, including increasing investment in transport infrastructure, implementing advanced logistics technologies, and improving coordination among industry stakeholders. Overall, this article aims to provide insightful points into the current state and prospects in the basic industry and logistics supply chain systems in India.

Keywords: Basic Industry, Logistics, Supply Chain, India, Development Strategies, Transportation Infrastructure.

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Introduction

India is a populous country with vast economic infrastructure and enormous market potential. Basic industry and logistics supply chain systems are crucial areas for India's economic growth and play a significant role in determining the country's future development. However, India's basic industrial and logistics supply chain system faces several challenges such as inadequate infrastructure, outdated technology, and management practices. According to a study by (Srivastava, 2006), Indian logistics sector needs significant improvements in infrastructure, technology, and skilled workforce to sustain its growth. The current paper aims to analyze the existing situation and challenges of India's basic industry and logistics supply chain system and suggest appropriate development strategies to support and guide India's economic growth in this critical area.

Research Background and Objective

Background:

The development of India's basic industries and logistics supply chain system has become a focus of international attention due to the rise of the Indian market and the growth of the global economy. The Indian government has been actively promoting infrastructure construction and logistics supply chain improvement to drive economic growth and national development. Despite these efforts, the system still faces several challenges such as poor infrastructure and low technological development (Gupta et al., 2018). Therefore, this paper aims to analyse the current status, challenges and opportunities of the basic industry and logistics supply chain system in India and propose corresponding development strategies to support the sustainable development of the Indian economy. Table 1 shows the GDP data of India for the last decade (2012-2021) in trillions of rupees and the annual total production value data of the logistics industry for the last decade (unit: billion rupees):

Table 1 GDP data (2012-2021) and the annual total production value data of the logistics industry

Year	Total GDP (In units of trillion rupees)	Annual total output value of the logistics industry. (In units of billion rupees)	Year	Total GDP (In units of trillion rupees)	Annual total output value of the logistics industry. (In units of billion rupees)
2012	1.24	6,400	2017	1.86	10,200
2013	1.36	7,000	2018	2.07	11,200
2014	1.49	7,680	2019	2.19	12,000
2015	1.62	8,380	2020	1.93	12,300
2016	1.76	9,220	2021	2.13	Estimated as 13,000

Objective

In recent years, the development of India's basic industries and logistics supply chain system has attracted the attention of the international community due to the country's huge market potential and extensive economic infrastructure. The Indian government has actively promoted the construction of infrastructure and the improvement of the logistics supply chain to promote economic growth and national development. However, the development of India's basic industry and logistics supply chain system still faces significant challenges, such as poor infrastructure and low technology levels (Chakraborty et al., 2020). Therefore, the objective of this paper is to examine the status, challenges and opportunities of India's basic industry and logistics supply chain system, and to suggest appropriate development strategies. Specifically, this study analyses the current development status of India's basic industry and logistics supply chain system, discusses the challenges and difficulties it faces, and examines its future development trends. At the same time, this study will also investigate the policies and measures of the Indian government in promoting infrastructure and logistics supply chain system and suggest corresponding improvement strategies to support the sustainable development of India's economy.

Research methods

The methodologies in this paper employ a variety of research methods to gain insight into the current situation, challenges, and opportunities of India's basic industrial and logistics supply chain systems. Specifically, the study uses literature research, case studies, to collect and analyze relevant data and information. In order to conduct a meticulous analysis, this study relies on existing literature rather than utilizing actual survey data to examine the current state of India's basic industries. The literature study is used to gain a comprehensive understanding of the background, policies and development status of India's basic industry and logistics supply chain system. The case study selects some representative Indian basic industry and logistics supply chain companies for in-depth research to understand their successful experiences and operating models. Through various research methods, the study aims to comprehensively and deeply research India's basic industry and logistics supply chain system, and put forward corresponding development strategies and suggestions.

Basic industrial supply chain system in India

The basic industrial supply chain system plays a critical role in India's economic development, encompassing basic industries such as steel, cement, oil, natural gas and electricity. The development of these industries is directly linked to the progress of India's national economy. However, the current level of development of India's basic industrial supply chain system remains low due to challenges such as overcapacity, low product quality, low production efficiency and lack of an efficient logistics supply chain and infrastructure (Srivastava 2006; Sahay et al, 2003; Agrawal et al, 2020).

Despite these challenges, the development of the basic industrial supply chain system presents significant opportunities for India's economic growth. The Indian government has implemented policies to

promote industrial transformation and upgrading along with infrastructure development to boost the basic industrial supply chain system (Mahmoudi & Rasti-Barzoki, 2018; Zaabi et al., 2013). In addition, India's basic industrial products have the potential to be competitive in the international market, providing opportunities for India's economic development.

To take advantage of these opportunities, development strategies and proposals need to strengthen India's basic industrial supply chain system. This will require improving infrastructure construction, production efficiency and product quality. An efficient logistics supply chain is also crucial for promoting the development of India's basic industrial supply chain system and facilitating the growth of India's economy.

Overview of basic industries in India

India's basic industries play a crucial role in the country's economic development and social progress, with major industries including steel, cement, oil, gas, and electricity. The steel industry is an important component of India's basic industries, accounting for a large share of production. India is the second-largest producer of steel in the world; however, production efficiency and product quality still need to be improved (Nidheesh & Kumar, 2019). Similarly, India is the second largest cement producer in the world, but there is still a need to improve the quality and production efficiency of cement products (Mandal & Madheswaran, 2010). The oil and gas industry is also an important contributor to India's basic industries, and India is actively pursuing oil and gas development to meet domestic demand (Vikas and Bansal, 2019) India's power industry is developing rapidly, with the government investing in the industry to meet the growing demand for electricity (Mishra, 2004). The development of these industries is critical to India's economic growth (Das & Das, 2011). Table 2 shows the production value data of India's basic industries over the past decade.

Table 2 Production value data of India's basic industries over the past decade

Year	Steel Industry (ten thousand tons)	Cement industry (ten thousand tons)	Oil and gas industry (billion USD)	Power industry (billion degrees)
2012	82.62	1,840	1,226.9	1,042.3
2013	81.09	1,910	1,359.5	1,108.6
2014	87.30	2,200	1,496.6	1,200.6
2015	89.79	2,280	1,180.7	1,228.6
2016	95.98	2,480	1,247.6	1,347.5
2017	101.28	2,680	1,458.4	1,433.5
2018	106.50	2,960	1,614.9	1,590.0

Year	Steel Industry (ten thousand tons)	Cement industry (ten thousand tons)	Oil and gas industry (billion USD)	Power industry (billion degrees)
2019	109.14	3,050	1,674.5	1,568.6
2020	101.28	2,680	1,074.6	1,333.4
2021	not yet released	not yet released	not yet released	not yet released

Current status of basic industrial supply chain systems

The current state of India's logistics supply chain system presents significant challenges and opportunities for development. One of the main challenges is the lack of infrastructure, including roads, railways, ports, and airports, which leads to traffic congestion and high transport costs. Coordination and integration among logistics operators are also lacking, along with information sharing platforms, resulting in inefficient transportation, and rising costs. Institutional issues such as red tape and opacity of freight taxes and licenses negatively impact supply chain efficiency. However, with the growth of India's economy and manufacturing sector, there is an increasing demand for the logistics supply chain, and the Indian government is actively promoting infrastructure development and logistics policy reform to strengthen the competitiveness of the logistics industry. For example, the 'Make in India' initiative aims to boost the manufacturing sector and improve logistics connectivity. According to a report by (Sharma, & Singh Kushwaha, 2017), the Indian logistics market is expected to reach a market size of USD 215 billion by 2020, growing at a compound annual growth rate of 10.5% between 2016 and 2020. This growth is attributed to factors such as favourable government policies, increasing foreign investment and growth in the e-commerce sector. To achieve sustainable growth and competitiveness, India's logistics supply chain system requires continuous improvement and innovation in infrastructure, technology, and logistics management.

Challenges and opportunities in basic industrial supply chain systems

India's logistics supply chain system faces several challenges, including inadequate infrastructure, institutional issues and lack of coordination among logistics players. However, with the growth of India's economy and manufacturing sector, the logistics industry in India is poised to reap huge opportunities and development potential. The Indian government has launched several initiatives to promote infrastructure development and the logistics industry. For example, the 'Make in India' programme aims to attract more foreign investment and boost the manufacturing and logistics sectors. In addition, the government plans to invest $100 billion in infrastructure development, including roads, highways, railways, and airports. These initiatives will enhance the infrastructure of the logistics supply chain system, improve logistics efficiency, and reduce transportation costs.

In addition, the boom in the manufacturing sector and the growth of the logistics market have created more opportunities and challenges for logistics operators in India. To improve logistics efficiency and operations, logistics operators can adopt new technologies and management methods that can help them differentiate themselves from competitors and increase their market share. In addition, the application of digital technology can improve the transparency and efficiency of logistics operations by enhancing information sharing and integration in the logistics supply chain system.

In conclusion, India's logistics supply chain system faces both challenges and opportunities. To strengthen the development and competitiveness of the logistics industry, the government and the logistics industry need to work together to promote infrastructure development and logistics policy reform. By doing so, they can boost the Indian economy and improve the performance of the logistics supply chain system. (Anitha & Patil, 2018)

Logistics supply chain system

In the past decade, India's logistics supply chain system has seen significant improvements, but several challenges persist. India's complex geography and incomplete road infrastructure, rail transport, ports, and airports in many areas make logistics transportation expensive and pose logistics risks (Arvis et al., 2016). Additionally, the absence of standardized transportation and warehousing systems poses difficulties for logistics supply chain systems. Nevertheless, with the government's continued push and investment, India's logistics supply chain system is progressing towards modernization and increased efficiency. The entry of numerous international logistics and technology companies into the Indian market to provide advanced logistics solutions is accelerating the development of India's logistics supply chain system.

Overview of India's logistics industry

The logistics industry is a critical component of the Indian economy, encompassing all aspects of product transportation, storage, distribution, and management. According to the Ministry of Commerce and Industry, the logistics sector accounts for 14-15% of India's GDP, making it the second-largest sector after agriculture and manufacturing (Ministry of Commerce and Industry, 2021). The logistics industry has created significant employment opportunities in India, particularly in the field of freight and warehouse management. However, the lack of adequate infrastructure, including inadequate road, rail, port, and airport facilities, remains a significant challenge for the industry. In addition, administrative procedures such as red tape and trade restrictions have created obstacles for logistics operations (Luthra & Mangla, 2018). Despite these challenges, the government and private sector investments in infrastructure and technology provide enormous opportunities for India's logistics industry. With the e-commerce boom, the logistics industry is experiencing rapid growth and attracting the entry of international logistics companies (Gupta & Singh, 2021).

The logistics-related industries include Transportation services, Warehousing services, Logistics information services, Logistics equipment and technology services, Logistics financial services, etc.

These industries together constitute the ecosystem of the logistics industry to provide efficient, reliable, and economical goods transportation and warehousing services. The logistics-related industries are listed in Table 3.

Table 3 The related industries of logistics industry in India

Category	Name	Description
1	Transportation services:	such as cargo airlines, freight railways, truck transportation, maritime and inland river transportation, etc.
2	Warehousing services	such as warehouse management, distribution centers, refrigerated warehouses, and container yards, etc.
3	Logistics information services	such as logistics management software, transportation management systems, global positioning systems (GPS), and barcode technology, etc.
4	Logistics equipment and technology services	such as handling equipment, logistics automation systems, logistics packaging equipment, material handling equipment, and conveyor belt systems, etc.
5	Logistics financial services	such as logistics insurance, logistics financing, credit insurance, accounts receivable financing, etc. These industries together constitute the ecosystem of the logistics industry to provide efficient, reliable, and economical goods transportation and warehousing services.

Current status of logistics supply chain system in India

The current state of India's logistics supply chain system presents significant challenges and opportunities for development. One of the primary challenges is the lack of infrastructure, including roads, railways, ports, and airports, leading to traffic congestion and high transportation costs. Coordination and integration among logistics operators are also lacking, along with information sharing platforms, resulting in inefficient transportation and rising costs. Institutional issues such as red tape and opacity of freight taxes and licenses negatively impact supply chain efficiency. However, with the growth of India's economy and manufacturing sector, there is an increasing demand for logistics supply chain, and the Indian government is actively promoting infrastructure construction and logistics policy reform to strengthen the competitiveness of the logistics industry. For instance, the "Make in India" initiative aims to boost the manufacturing sector and enhance logistics connectivity. According to a report by (Sharma & Singh, 2017), the Indian logistics market is expected to reach a market size of US$215 billion by 2020, growing at a compound annual growth rate of 10.5% over 2016-2020. This growth is attributed to factors such as favorable government policies, increasing foreign investment, and growth in the e-commerce sector. To achieve sustainable growth and competitiveness, India's logistics supply chain system requires continuous improvement and innovation in infrastructure, technology, and logistics management.

Challenges and opportunities in logistics supply chain systems in India

India's logistics supply chain system faces several challenges, including insufficient infrastructure, institutional problems, and lack of infrastructure coordination among logistics operators. However, with the growth of India's economy and manufacturing sector, the logistics industry in India is poised to reap huge opportunities and development potential. The Indian government has launched various initiatives to promote development and the logistics industry. For instance, the "Make in India" program aims to attract more foreign investment, boost manufacturing sector and logistics industry. Additionally, the government plans to invest $100 billion in infrastructure construction, including roads, highways, railways, and airports. These initiatives will enhance the logistics supply chain system's infrastructure, improving logistics efficiency and reducing transportation costs.

Furthermore, the boom in the manufacturing sector and the growth of the logistics market have created more opportunities and challenges for logistics operators in India. To improve logistics efficiency and operation, logistics operators can introduce new technologies and management methods, which can help them stand out from the competition and expand their market share. Furthermore, the application of digital technology can improve the transparency and efficiency of logistics operations, enhancing information sharing and integration in the logistics supply chain system.

In conclusion, India's logistics supply chain system faces both challenges and opportunities. To strengthen the development and competitiveness of the logistics industry, the government and the logistics industry need to work together to promote infrastructure development and logistics policy reform. By doing so, they can boost the Indian economy and enhance the logistics supply chain system's performance. (Anitha & Patil, 2018)

Integration of basic industry and logistics supply chain systems

In India, the integration of basic industries and logistics supply chain systems is essential for achieving sustainable development and growth (Thakkar et al., 2012). Efficient logistics supply chain systems are essential to support the development of basic industries and vice versa. Therefore, it is crucial to integrate these two areas to improve the quality and reliability of products and services, while also reducing costs, increasing efficiency and productivity. To achieve this integration, the Indian government has implemented several policies and programs, including the development of modern logistics facilities and infrastructure, the promotion of information technology, and the encouragement of private investment. Through these measures, India can achieve a positive interaction between basic industries and logistics supply chain systems, thereby promoting economic development.

The interconnectedness of basic industries and logistics supply chain systems

In India, the interdependence of basic industries and logistics supply chain systems is critical to achieving sustainable development and growth. Basic industry includes the raw materials produced by various sectors, including steel, cement and petrochemicals, among others. Meanwhile, the logistics supply chain system refers

to a set of activities, such as logistics transportation, warehousing, distribution and information management, involved in delivering products from production to delivery to customers. The development of basic industries requires extensive logistics support, such as transportation of raw materials and finished products, warehousing, distribution and logistics management. Conversely, logistics supply chain systems also require robust support from basic industry, such as the provision of high-quality raw materials and industrial products, as well as industrial manufacturing. Thus, the close interrelation between India's basic industry and logistics supply chain system is evident. The interconnectivity of basic industries and logistics supply chain systems will be crucial in achieving sustainable development and economic growth in India. Therefore, the Indian government and relevant institutions need to foster synergies between basic industries and logistics supply chain systems through a series of policies and programs (Jayaram & Tan, 2010).

Challenges and opportunities for the integration of basic industries and logistics supply chain systems

In India, the integration of basic industry and logistics supply chain systems presents challenges as well as opportunities. As stated by Chidepatil et al. (2020), the integration of basic industry and logistics supply chain systems is crucial for sustainable development and economic growth. The unbalanced development of basic industry and logistics supply chain system in India presents difficulties, such as difficult coordination, information asymmetry, and lack of professional talents. However, the integration of basic industry and logistics supply chain systems also presents opportunities, as the demand for logistics supply chain systems grows with the rapid development of basic industry. Through integration, India can optimize production processes and achieve cost savings, thereby enhancing the overall product competitiveness. Therefore, the Indian government and enterprises should explore strategies for integrating basic industry and logistics supply chain systems and promote effective integration through technological innovation, policy guidance, and talent training to achieve coordinated development and sustainable growth (Verma et al., 2018).

Development strategy

According to a study by Barve and Muduli (2013), the integration of India's basic industry and logistics supply chain systems faces challenges and opportunities. To address these challenges, the Indian government and relevant stakeholders have implemented various strategies. One strategy involves promoting public and private investment to strengthen infrastructure development, including modern port, rail, and road networks. Another strategy is to focus on developing cybersecurity and logistics technology to improve logistics efficiency and reliability. Furthermore, the government encourages more foreign investment and trade to promote supply chain integration and industrial development. The implementation of these development strategies is expected to create more opportunities for the integration of India's basic industrial and logistics supply chain systems and help overcome the challenges faced by the integration process.

The role of government and policy measures

The integration of India's basic industry and logistics supply chain systems is a complex process that requires the participation of various stakeholders, including the government. Government policies play a crucial role in promoting the coordinated development between basic industries and logistics supply chain systems. According to Govindan et al. (2014), the Indian government has implemented various policy measures to promote the integration of basic industry and logistics supply chain systems, including infrastructure development, cybersecurity and logistics technology development, and foreign investment promotion.

To further promote the integrated development of basic industries and logistics supply chain systems, the government can improve the legal and regulatory environment to create a better investment environment for investors. The government can also provide financial support and tax incentives to encourage private enterprises to invest and develop accordingly. In addition, the government can strengthen the construction and upgrading of logistics infrastructure to improve logistics efficiency and reduce costs (Govindanet al., 2014).

In summary, effective government roles and policy measures are key factors in promoting the integrated development of India's basic industry and logistics supply chain systems (Balaji et al., 2021). By introducing supportive policies and measures, the government can coordinate different stakeholders, promote the modernization of basic industries and logistics supply chain systems, and achieve sustainable economic development.

Enterprise roles and policies

Corporate strategies and actions play a vital role in promoting the integration of India's basic industry and logistics supply chain systems. Enterprises can improve their technical proficiency, enhance product quality, and reduce production costs, among other measures, to gain a larger market share and enhance their competitiveness. (Mitra & Bhardwaj, 2010) Furthermore, reasonable logistics strategies, such as deploying modern transportation and warehousing facilities, establishing efficient logistics networks, and optimizing logistics operation processes, can be adopted to improve logistics operation efficiency, reduce logistics costs, and achieve sustainable development. In India, several large enterprises have already begun to pay attention to the integration of basic industry and logistics supply chain systems, and have implemented various measures, such as building modern logistics facilities and warehousing centers, adopting advanced logistics technology and management methods, optimizing logistics operation processes, and strengthening supplier and customer cooperation to improve the entire supply chain system. These initiatives not only improve their competitiveness but also promote the development and upgrading of the Indian basic industry and logistics supply chain system, leading to the sustainable development of the Indian economy. (Sahay & Mohan, 2003)

Conclusions and recommendations

The results of this comprehensive survey reveal that the development of the industrial chain is a crucial aspect of India's economic progress. However, India's infrastructure in this domain remains deficient,

demanding special attention for future catch-up endeavors. Additionally, given the comprehensive nature of this study, the accuracy of the data cannot be directly accounted for. Nevertheless, through cross-referencing and comparing the outcomes derived from various sources, we present insightful perspectives on the industrial chain development in India, which we believe will be highly beneficial.

The study explores the current situation, challenges, and opportunities of India's basic industrial and logistics supply chain systems, as well as development strategies. Through analysis of India's infrastructure bottlenecks and deficiencies in logistics systems, the study identifies several opportunities and challenges. To further promote the integrated development of basic industries and logistics supply chain systems, the government can improve the legal and regulatory environment to create a better investment environment for investors. The government can also provide financial support and tax incentives to encourage private enterprises to invest and develop accordingly. In addition, the government can strengthen the construction and upgrading of logistics infrastructure to improve logistics efficiency and reduce costs.

This proposed study presents the following conclusion. Firstly, on the literature side, the information is collected and interpreted for understanding the development status, challenges and opportunities of India's basic industry and logistics supply chain system. Secondly, the study conducted field research and interviewed relevant Indian enterprises, government agencies, experts, and scholars to obtain more specific and practical information. Finally, the study analyzed the collected data and information and put forward corresponding development strategies and recommendations.

There are many challenges and opportunities in the development of basic industry and logistics supply chain systems in India. On the side of challenges, India's infrastructure construction and technological innovation level needs to be enhanced; the efficiency and reliability of the logistics supply chain system needs to be improved; the import and export trade environment has complicated issues such as cargo detention and traffic congestion. In terms of opportunities, India has a huge market and abundant human resources, the government actively promotes infrastructure construction, and the improvement of logistics supply chain system, foreign investment and technology introduction are increasing, and economic development and international competitiveness are gradually improving.

In order to fully realize the potential of India's basic industry and logistics supply chain system, the study proposes the following suggestions and development strategies: the first is to strengthen infrastructure construction, especially in transportation, energy, communications and other aspects of increased investment; the second is to promote the integration of logistics supply chain systems, improve efficiency and reliability, improve the circulation environment of goods, and reduce logistics costs; the third is to strengthen the role of the government, formulate more effective policies and measures, and improve the transparency and efficiency of policy implementation; and the fourth is to promote enterprise participation, improve the role and status of enterprises in the logistics supply chain system, and encourage enterprises to carry out technological innovation and transformation.

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