

THE FACTORS INFLUENCING THE SUCCESS OF RAILWAY TRANSPORTATION: A CASE STUDY OF CHINA RAILWAY EXPRESS

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ABSTRACT

In The Belt and Road Initiative, China Railway Express is an international railway container transportation project, which promotes the development of trade and related industries in the countries along The Belt and Road Initiative. In the development of China Railway Express, it still has some problems that are barriers to its development, such as vicious competition and routes overlap. The objective of this research is to find the priority factors that influence the development and success of China Railway Express and present the development countermeasures and suggestions to China Railway Express. In this research, the author applied the Analytic Hierarchy Process to measure and find the priority factors. According to the development status of China Railway Express, the author found the factors that related to railway transportation from the literature. Then, the author designed the questionnaire by these factors. According to the data collection results, the author measured the factors' importance degree by factors' weight. The factors that have high weights are priority factors, which have a significant effect on the success and development of China Railway Express. Based on these priority factors, the author proposed the development countermeasures to China Railway Express, which can be the reference to the decision-makers. The author hopes that government should propose suitable policies for China Railway Express to improve the current weakness parts to get great development and make China Railway Express a remarkable success.

Key Words: *The Belt and Road Initiative, Railway Transportation, China Railway Express, Analytic Hierarchy Process, Priority Factors*

บทคัดย่อ

รถไฟด่วนจีนเป็นโครงการรถไฟขนส่งสินค้าเพื่อส่งเสริมการค้าและอุตสาหกรรมที่เกี่ยวข้องในประเทศที่อยู่ตามเส้นทางซอริเริ่มหนึ่งแถบหนึ่งเส้นทาง ในการพัฒนารถไฟด่วนจีนมีปัญหาเกี่ยวกับการแข่งขันอย่างรุนแรงและเส้นทางทับซ้อน บทความนี้มีวัตถุประสงค์เพื่อสืบค้นปัจจัยที่มีอิทธิพลต่อการพัฒนาและความสำเร็จของรถไฟด่วนจีน รวมถึงนำเสนอมาตรการรับมือและข้อเสนอแนะแก่รถไฟด่วนจีน ผู้วิจัยใช้การวิเคราะห์ตามลำดับชั้นในการวัดและหาปัจจัยสำคัญ มีการเก็บข้อมูลโดยใช้แบบสอบถาม ซึ่งผลที่ได้ทำให้ผู้วิจัยสามารถวัดความสำคัญของปัจจัยโดยการถ่วงน้ำหนักได้ ปัจจัยที่มีค่าสูงเป็นปัจจัยที่ให้ความสำคัญลำดับต้นๆ ทั้งยังเป็นปัจจัยที่มีผลต่อความสำเร็จและการพัฒนารถไฟด่วนจีน ผู้วิจัยได้นำเสนอมาตรการรับมือเพื่อนำไปปรับปรุงและพัฒนารถไฟด่วนจีนต่อไป

คำสำคัญ: ซอริเริ่มหนึ่งแถบหนึ่งเส้นทาง การขนส่งทางรถไฟ รถไฟด่วนจีน การวิเคราะห์ตามลำดับชั้น ปัจจัยที่ให้ความสำคัญลำดับต้นๆ

Received August 2019

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INTRODUCTION

Since the 1820s, railway transportation has played a significant role in the transportation system, which promoted the development of economy and society. With the development of time and technology, the railway transportation has shown great potential for development in the world. For saving the transportation cost and time, many countries set up the Land Bridges transportation such as Eurasian Land Bridges. The Land Bridges promote the development of railway transportation between continents. And the countries along the Land Bridges also get the benefits from Land Bridges, which encourage the development of economy and society and communication of cultures.

The Silk Road Economic Belt and the 21st century Maritime Silk Road, also known as The Belt and Road (B&R), is a development initiative that was created by President Xi Jinping of the People's Republic of China (PRC) in September and October 2013. There is a transnational economic cooperation belt that is dominated by the Chinese government. This economic belt covers countries and areas of China, Central Asia, North and Western Asia, the Indian Ocean coast, and the Mediterranean seacoast, the Silk Road, and the Maritime Silk Road, which is the member of the ancient land-based Silk Road and ocean-going Maritime Silk Road.

Figure 1: The Main Routes of China Railway Express



Source: Luo (2017)

In The Belt and Road Initiative, there is an international railway transportation program that is called as China Railway Express, which is an international container railway transport project that is operated by China Railway Corporation Company with the fixed routes, schedule, and the number of trains. It is from China to the European countries along The Belt and Road. In The Belt and Road, there are three operation routes which are Eastern Route (Departure China from Manzhouli), Central Route (Departure China from Erenhot), and Western Route (Departure China from Dzungarian Gate called Alashankou.). Since 19th March 2011, the first China Railway Express has been successfully operating, from Chongqing, China to Duisburg,

Germany, and the Chinese government has already set up this project in many provinces. As of April 2018, there are 65 operating routes. Forty-three cities set up the China Railway Express project and the trains are heading to 14 European countries including 42 cities. The total number of operating trains is over 9,000.

Since 2011, the China Railway Express has shown an increasing trend, which is a good signal for this project. At present, the China Railway Express stays in the early stage of development, thus, China Railway Express is confronted with a variety of problems, including routes overlap, vicious competition and empty container transportation in the return trip. Due to the Chinese economy is keeping high-speed development, the trains do not need to consider the sources of goods when they head to Europe. However, when the trains come back to China, the situation of the empty container is easy to find. The departure and return have unbalanced development, most routes always have empty containers in the return trip. In China, most provinces have set up the China Railway Express project, but those projects are independent of other provinces. The local governments only consider and care for their own trains. Between the neighbouring provinces, they do not collaborate with each other. Some provinces' routes overlap. From the perspective of resource allocation, some railway sections of the cities in the western area of China overlap with each other in the development of the Eurasia Land Bridge. Some inland cities compete for the starting point of the China-EU railway passage without any cost. Some provinces' projects survive because of the government subsidies even they incur a deficit, leading to vicious competition.

The development of China Railway Express shows an increasing trend, but some factors and problems still restrict its development, such as vicious competition routes overlap and empty container transport in the return, etc. China Railway Express should have clear guidelines of development, which will promote and help China Railway Express get good performance. As a significant project in The Belt and Road Initiative, the China Railway Express should continually improve itself to get its success. In this research, the author discussed the factors that influence the development of China Railway Express and concluded them to help the project classify the remarkable factors of success. The main objectives of this study are to analyze and find the factors that influence the success of railway transportation, which will promote the performance and development of China Railway Express. According to those factors, the author proposes the development countermeasures to China Railway Express, which helps improve the current situation of China Railway Express and promote its development.

REVIEW OF THE RELATED LITERATURE

Railway Transportation

When the railway was first introduced, it transformed the business world and changed the scale and dispersion of economic activity and the locus of population growth. Vance (1986) illustrated the evolution of railway and highway systems in terms of economic geography, such as Europe and North America. The new technologies provide better methods to get over barriers of geography for trade and development. Cronon (1991) illustrated that Chicago has become Natural Metropolis by the railway technology and the advantages of railway network. It makes Chicago as the gateway of American west.

There is a disadvantage of railway freight which is the lack of flexibility. For this reason, the railway freight has already lost some freight business to motor carriers. However, a lot of

government encourage to use railway freight, because it will bring environmental benefits, and the railway transportation is very energy efficient (ICF International, 2009).

Fawcett et al. (2006) evaluated the main transportation modes, including rail, motor carriers, pipeline, ship, airplane and internet. The evaluation of rail is shown in Table 1.

Table 1: Railway Evaluation

Cost	High fixed, low variable cost structure; Inexpensive, especially for bulk goods
Speed	Relatively slow, average car speed 20 MPH (unless utilizing double stack unit trains, effectively doubling speed)
Quantities	Large quantities; full car load increments most cost effective
Geographical Coverage	Widespread on some continents; limited by tracks, landmass
Environmental Concerns	High impact of new tracks, low air pollution
Distances	Medium to long
Required Infrastructure	Tracks, rolling stock
Product Variety	Large variety of products; ideally suited for bulk goods
Reliability	Low loss, damage, less timely (delays at sidings, terminals)
Flexibility	Routing limited to track location, little door to door delivery (side spur required)

Source: Fawcett et al. (2006)

China Railway Express

For some Chinese manufacturers, the China Railway Express service improves 10% survival rate to them. There is a substitute option to the logistics. According to the statistical data of China Railway Corporation, the China Railway Express is cheaper than the air transport and faster than the maritime transport. Almost all China Railway Express trains arrive at the destination on time. Logistics service is a physical linkage for the Europe-China connection, which encourages to develop economical linkage. The development of China Railway Express needs a better regulation to solve high cost, disorderly competition, poor infrastructure, and inefficient customs clearance. The China Railway Express Companies pursue a higher-level service to improve customer satisfaction. The customers can directly communicate to the account managers who coordinate the entire process, including customs clear and warehousing. They do not need to face all the processes alone (Luo, 2017).

In The Belt and Road, the Chinese Railway enhances the connectivity between China and Europe. The China Railway Express is a typical example of connection. The goods are transported from Europe to China, and distributed to other places in Asia. This railway route provides the transportation option from China to Europe and reduces logistics cost. The China Railway Express shows the advantages of railway transportation and promotes the transportation development of the countries along The Belt and Road (Yan, 2017).

The development of The Belt and Road Initiative enables the communication of trade and economy to be strengthened between China and the countries along The Belt and Road Initiative, which requires high speed and quality transportation. China Railway Express has high operation speed, which can satisfy the requirement of transportation. It has contributed to the development of the economy. For the future development, China Railway Express should cooperate with other operators of railway logistics and build market-based solicit good mechanism. In addition, it should improve the ports' function and expand its service regions (Sun et al., 2018).

Factors involving the Transportation System

According to the feature of railway transportation and development status of China Railway Express, the author found the 20 factors from the related literatures, and classify them to different categories. The total factors are shown in Table 2.

Table 2: Factors in the Transportation System

Dimensions	Factors
Administration	Ministry of Railway
	Rail Freight Operators
	Railway Development Plan
Economic	Inter-Governments Support
	Type of Investment
	Market Development
	Collaboration Mechanism
Logistics	Global Economy
	Infrastructure Connectivity
	Intermodal
	Rail Freight Cost
Social	Customs Process
	Occupation Opportunities
	Sustainability
	Security
Technology	Customer Satisfaction
	Flexibility
	Lead Time
	Safety
	Reliability

Analytic Hierarchy Process

In 1970s, Professor Thomas Saaty introduced the Analytic Hierarchy Process, which was applied to solve many complex decision-making problems in service and manufacturing industries. Saaty described Analytic Hierarchy Process as follows:

“The Analytic Hierarchy Process (AHP) is a theory of measurement. When applied in decision-making, it assists one to describe the general decision operation by decomposing a complex problem into a multi-level hierarchic structure of objectives, criteria, sub-criteria and alternatives. The AHP provides a fundamental scale of absolute magnitudes to represent judgments in the form of paired comparisons. A ratio scale of relative magnitudes expressed in priority units is then derived from each set of comparisons. An overall ratio scale of priorities is synthesized to obtain ranking of the alternatives.”

The Analytic Hierarchy Process has its unique ability to decompose the current problems by the factors of qualitative and quantitative. Based on the nature of analytic, the objective and subjective data are transformed into the numbers that will be measured by mathematics. Then, people can scientifically choose and explain the results. The chosen results can be the expert choice results or group choice results, which depend on the data generated by interviewing one expert or a group of people. The term hierarchy implies the decision that problems can be broken down and structured in different levels, including goals, criteria, sub-criteria and alternatives. Based on the relationship between overall goal and criteria, the goal of the AHP is to make choices in the alternative plans. The AHP is a dynamic method because in the whole

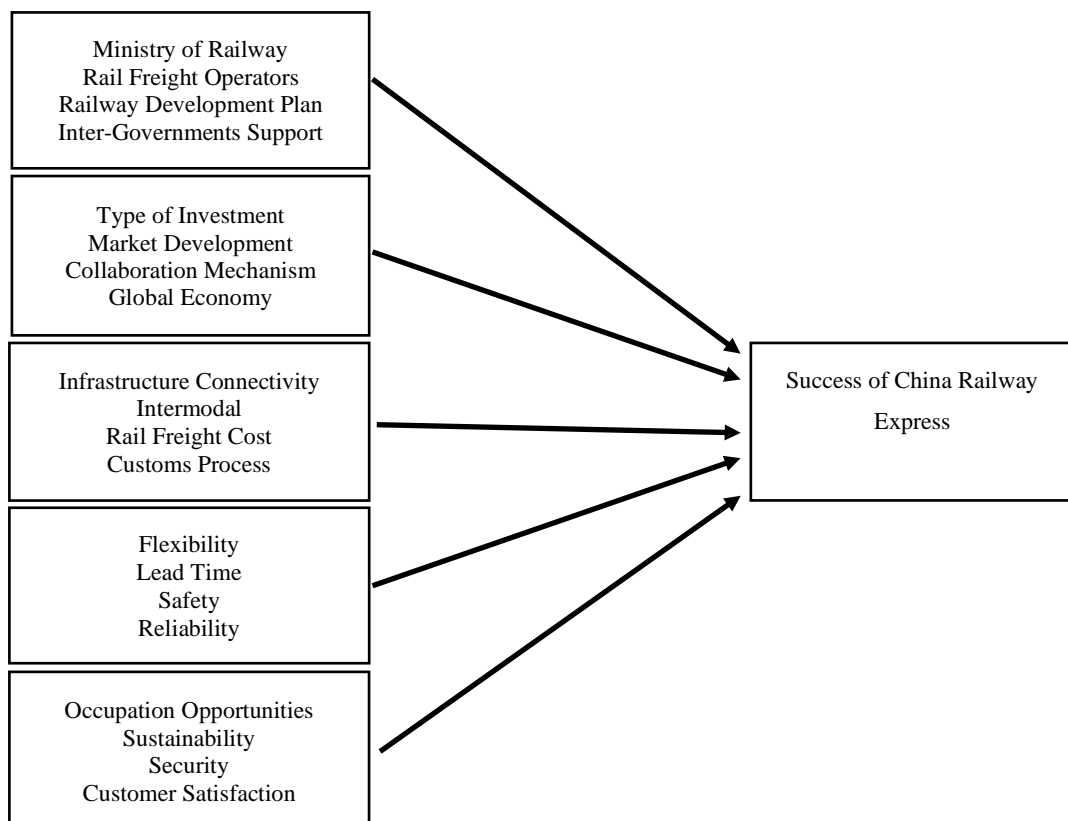
process, it allows people to reconsider data, to collect new data, to negotiate data (The time will promise those negotiation of data.), then the group consensus on data will be formulated by a correct running of decision-making sessions. Therefore, the Analytic Hierarchy Process is applied to strategic planning in most organizations, which will help companies and organizations to make decisions (Wu & Wu, 1991).

The Analytic Hierarchy Process has multiple benefits (Saaty, 1980). First, it helps the unstructured problem to decompose into a rational decision hierarchy (like the decision tree). Second, based on pairwise comparison of individual groups of factors, it will collect more information from experts and decision-makers. Third, it sets up the calculation to assign weights to the factors. Fourth, the consistency of the rating from decision-makers and experts will be validated by consistency measurement. Therefore, the qualitative and quantitative substances compose the Analytic Hierarchy Process.

CONCEPTUAL MODEL AND HYPOTHESIS

The conceptual framework (Figure 2) presents the success factors that influence the development of China Railway Express. Overall, this research generally discussed the relationship between these factors and the development of China Railway Express. However, the framework is only to determine the success factors that influence the development of China Railway Express. It cannot be the conclusive research of the development of China Railway Express. Nevertheless, there is a significant model to the future studies in China Railway Express and logistics activities of international transportation. It can help develop the decision-making mechanism, which is good to improve the competitive advantage and performance of logistics activities.

Figure 2: The Conceptual Framework of the Success Factors for China Railway Express



This thesis was conducted to analyze, discuss and answer the following research questions: What factors influence the success of China Railway Express? and How to make China Railway Express successful?

The above research questions have led to the development of the two research objectives as follows:

Research Objective 1: Influence between factors and development of China Railway Express

Research Objective 2: Countermeasure to the development and success of China Railway Express

From the above proposed conceptual framework and research questions, this thesis formulated and applied under the context of the factors that influence the development and success of China Railway Express the following hypotheses:

Administration Dimension

H1: The Ministry of Railway has an influence on the development and success of China Railway Express.

H2: The railway freight operators has an influence on the development and success of China Railway Express.

H3: The railway development plan has an influence on the development and success of China Railway Express.

H4: The Inter-governments support has an influence on the development and success of China Railway Express.

Economic Dimension

H5: The type of investment has an influence on the development and success of China Railway Express.

H6: The market development has an influence on the development and success of China Railway Express.

H7: The collaboration mechanism has an influence on the development and success of China Railway Express.

H8: The global economy has an influence on the development and success of China Railway Express.

Logistics Dimension

H9: The infrastructure connectivity has an influence on the development and success of China Railway Express.

H10: The intermodal has an influence on the development and success of China Railway Express.

H11: The railway freight cost has an influence on the development and success of China Railway Express.

H12: The customs process has an influence on the development and success of China Railway Express.

Social Dimension

H13: The occupation opportunities have an influence on the development and success of China Railway Express.

H14: The sustainability has an influence on the development and success of China Railway Express.

H15: The security has an influence on the development and success of China Railway Express.

H16: The customer satisfaction has an influence on the development and success of China Railway Express.

Technology Dimension

H17: The flexibility has an influence on the development and success of China Railway Express.

H18: The lead time has an influence on the development and success of China Railway Express.

H19: The safety has an influence on the development and success of China Railway Express.

H20a: The reliability has an influence on the development and success of China Railway Express.

The conceptual framework and hypothesis were proposed being constituted by the Principle of the Analytic Hierarchy Process. This model demonstrates and explains the relationship between factors that influence the success of China Railway Express and the development of China Railway Express. And it researches the degree of influence of the factors for the development of China Railway Express.

METHODOLOGY

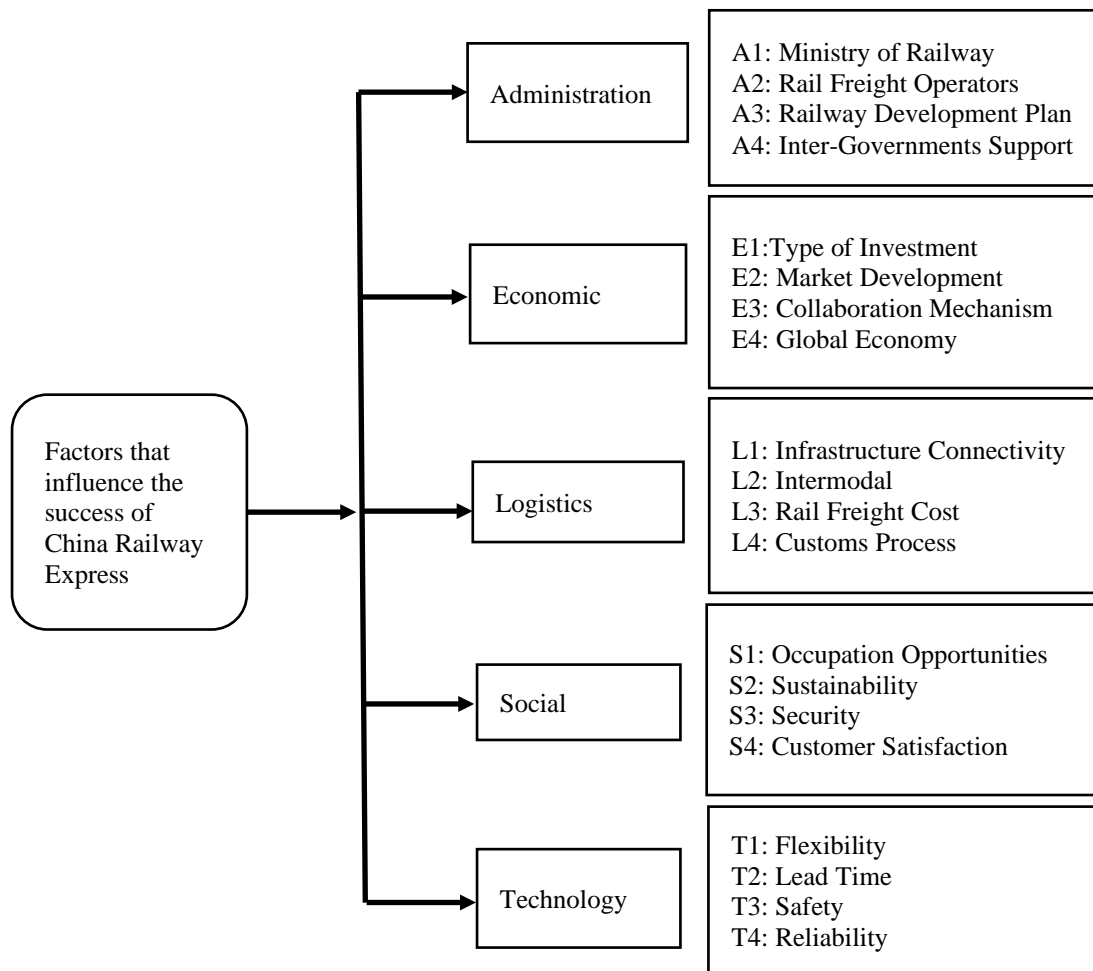
In this research, the research methodology follows the principle of the Analytic Hierarchy Process. This research has selected the participants for the questionnaire by the judgment of the author. This research applied a questionnaire survey to gather data from the China Railway Express in order to analyze and examine all research question questions and hypotheses. The sample size of this study consisted of 30 respondents (10 from the academic institutes and universities, 10 from governments officers and 10 from railway operators). The participants come from three areas, which can help the author to collect different viewpoints on the same thing.

Analytic Hierarchy Process Model

In the literature review, the author already picked up the factors involved in railway transportation from the literature. The author extracted 20 factors that influence the success of railway transportation from 25 literatures. Based on those factors' character, the author classed them into five main dimensions which are administration, economic, logistics, social, and technology. According to these factors, the author constructed the Analytic Hierarchy Process

model. The below figure illustrates the Analytic Hierarchy Process model, including five main dimensions - administration, economic, logistics, social and technology.

Figure 3: Analytic Hierarchy Process Model



Questionnaire Design

The questionnaire was designed by the Analytic Hierarchy Process Model. In the questionnaire, the author explained each part in detail to ensure that the participants completely understand the questionnaire. The evaluation of Analytic Hierarchy Process is in the same hierarchy, each factor (element) is compared with others known as the pair-wise comparison. Based on the pair-wise comparison, the participants can evaluate the relative importance between factors (elements). The ratio scale is basically classified into five levels which are equal importance, weak importance, essential importance, very strong importance and absolute importance. And endowing those levels to values as 1, 3, 5, 7 and 9 respectively. Between two ratio scales, setting up the intermediate values like 2, 4, 6 and 8 respectively.

Data Analysis

In this research, the author judged the important degree of factors by the factors' weight. The data is collected by the pair-wise comparisons. There are at least four elements in the same category; thus, the data may have inconsistency. Before calculating the final weight and vectors, the researcher must check the consistency of data. If the data has inconsistency, it must be rejected. Therefore, the researcher must apply the measure of consistency ratio to check the

consistency or inconsistency of data. When the whole hierarchy passes the consistency ratio hierarchy, the researchers can keep on calculating the weight of hierarchy, which will obtain the priority weight. The priority weight decides the important degree to each factor or element. According to the calculation result, the researchers and decision-makers can choose the priority factors.

FINDING

In terms of sample size, the Analytic Hierarchy Process only focuses on experts about one particular area. There is no need for a large number of participants because the method is mainly applied to handle complex problems that involve a group of people (Takala et al., 2006). And there is the main advantage of the Analytic Hierarchy Process, which does not require a statistically significant sample size (Baby, 2013). During the investigation period (December, 2018), the author collected 42 questionnaires, 11 from universities and institutes, 12 from the government department, and 19 from the local railway operator. Due to the Analytic Hierarchy Process focuses on the viewpoint of experts, the participants must have a high education background, rich working experience, working positions or academic position. Besides, their data must pass the checking consistency ratio. Saaty (1980) stated that the questionnaire is valid when the consistency ratio of questionnaires less than 0.1. After analyzing and comparing their information, and checking the consistency ratio, only 30 questionnaires were qualified.

After checking the consistency ratio, the author moved to the next step that is calculating the weight of dimensions and each factor helps to measure the factors' important degree. According to the calculation result of the factors' weight, the author presented the countermeasures and development suggestions to China Railway Express. The following table shows the total weight ranking and each group's weight ranking in the Analytic Hierarchy Process, which including the dimension level and factor level.

Table 3: The Weight of Dimensions and Factors in the Analytic Hierarchy Process Model

Level	Total	Group		
Dimension		Academic	Government	Operator
Administration	0.323	0.319	0.277	0.371
Economic	0.262	0.294	0.264	0.226
Logistics	0.160	0.144	0.201	0.136
Social	0.103	0.087	0.098	0.126
Technology	0.152	0.156	0.160	0.141
Factor				
Ministry of Railway	0.078	0.058	0.042	0.134
Railway Freight Operators	0.050	0.041	0.051	0.059
Railway Development Plan	0.057	0.052	0.069	0.051
International Governments Support	0.137	0.168	0.116	0.128
Type of Investment	0.051	0.079	0.043	0.031
Market Development	0.085	0.064	0.100	0.091
Collaboration Mechanism	0.054	0.046	0.072	0.045
Global Economy	0.071	0.105	0.049	0.059
Infrastructure Connectivity	0.070	0.058	0.073	0.079
Intermodal	0.024	0.024	0.026	0.023
Railway Freight Cost	0.039	0.029	0.067	0.019
Customs Process	0.027	0.032	0.035	0.014
Occupation Opportunities	0.028	0.024	0.031	0.030
Sustainability	0.031	0.023	0.025	0.044
Security	0.019	0.010	0.020	0.027
Customer Satisfaction	0.025	0.029	0.021	0.025
Flexibility	0.022	0.025	0.034	0.008
Lead Time	0.032	0.037	0.039	0.021

According to the views of participants, the author concluded the top five factors in each group. Overall, the participants have different backgrounds, therefore they hold different views for the same thing. For this reason, the factors' weight and their ranking are different in every group. However, some common factors still occupy the top place in each group, such as international government support, market development and infrastructure connectivity. The international governments support, market development and infrastructure connectivity appear at the top of the three groups, which means these factors are rather significant to participants. The global economy also important, which shows once in the academic group. Other factors including Ministry of railway, type of investment, collaboration mechanism, railway development plan, and safety only appear once in different groups, but it does not mean that they are not important. In the total weights rank, the factors' places are decided by the average of three groups' weight, because the degree of importance of the factors needs comprehensive consideration. In addition, for these factors, they are not isolated but closely related to each other, and they will influence each other. For example, the health and positive development trend of the economy will lead the prosperous market, which will promote the business development of China Railway Express and expand its market scale and cargo source. Based on the selected factors, the author has made a proposal for the countermeasures to China Railway Express discussed in the next segment.

Table 4: The Frequency of Top Factors in Each Group

Factor	Rank			
	Total	Academic	Government	Operator
International Governments Support	1	1	1	2
Market Development	2	4	2	3
Ministry of Railway	3			1
Global Economy	4	2		
Infrastructure Connectivity	5	5	3	4
Type of Investment		3		
Collaboration Mechanism			4	
Railway Development Plan			5	
Safety				5

International Governments Support

As an international railway transportation program, its development has a close relationship with the support of the international government, especially the countries along The Belt and Road Initiative. The national ministries and commissions such as the National Development and Reform Commission, the Ministry of Foreign Affairs, the Ministry of Commerce, and the Ministry of Transport should incorporate the relevant issues of the China Railway Express into the bilateral multilateral investment, trade, diplomacy, and transportation consultation mechanisms with countries along The Belt and Road Initiative. At the meantime, the Chinese government can introduce the China Railway Express to by The Belt and Road Forum for International Cooperation, which can help foreign governments to know this project, and get their support. Chinese embassies should play a significant role in coordination between the Chinese government and host countries, which focus on information communication and briefing. In addition, the China Railway Express is an entire brand image, one route cannot represent it. The government, enterprises, and social organizations should comprehensively publicize China Railway Express to the countries along The Belt and Road by multiple channels, methods and level, which not only publicizes the advantages of China Railway Express but also eliminates foreign governments' doubts to deepen cooperation. The good brand image is a benefit to get the international governments to support.

Market Development

With the development of China Railway Express, the role of government should be gradually lightened. The government should reasonably control the financial subsidy and period of policy support, which will encourage the companies to independently develop. Following the principle of the market economy, the market should play a dominant position in the resource distribution to improve the quality and profit of trains. According to the market demand and transport capacity of the transport routes, the operators plan the transportation routes and the number of trains and make the flexible price mechanism. In a region, suppliers should uniform the price negotiation to the foreign market to achieve large-scale operation, which occupies a dominant position in price negotiations. It will reduce logistics cost and increase their profit. And the government and operators must learn the newest information including global economic trend, market demand and every country's related policies to adjust their own plan and tactics, including the quota of import and export, price, and tax incentives.

There are many countries along The Belt and Road Initiative which have different demand. For example, The European market needs a cargo of high quality and low yield. The Central Asian market needs products with low price. The Chinese market also needs high-technology products. For the position of China Railway Express in the market, it needs to further optimise the market structure and refine the market function. In the geographic space, the operators should develop the market of Central Asia, Russia and Chinese Eastern-Coast developed area in a short term, then extend the market to the European countries and the Chinese Western undeveloped area. China Railway Express will lead the economic development in the countries along The Belt and Road Initiative, and it will lead related industries to transfer to the western area of China. For transportation performance including time. For the products, the trains should attract the cargos that are previously transported by sea with high added value and that have a requirement for timely transport, and goods that are not particularly demanding in time transported in air transport, which has a great expectation and potential in the market.

Ministry of Railway

In the railway transportation system, the department of the railway is the representative of the government, which will provide support in financial and political, technological parts. It plays a dominant role and coordinates with other ministries to promote the development of the railway. China Railway Corporation should optimise the transportation process and resource integration. In the transportation process, China Railway Express should develop direct and transfer trains, which can optimise the routes and avoid resource waste. China Railway Corporation should set up the complete system of dispatch and command to monitor and measure the whole process, which can improve the service quality of China Railway Express, such as on-time performance. According to market demand, China Railway Express should modify the number of trains. China Railway Corporation should propose the complete development plan including operation and transportation capacity improvement of the three channels. China Railway Corporation should coordinate with other ministries to strengthen support land policy including construction lands of channels and hubs. In addition, the relevant ministries should modify the related tax policy to eliminate the unreasonable charge of ports of entry. For the important ports of entry, their construction and operation must be smooth. The coordination of relevant ministries in terms of the trade policy like import and export quotas and the development of China Railway Express is needed. The ministry of the railway should strengthen cooperation with local and international logistics enterprises, ports enterprises and freight agents as well as encourage the Chinese enterprises to set up the representative institutes and a joint venture in the key regions.

In the operation process, the development and high-quality service of China Railway Express cannot leave the support of logistics hubs. The government should set up a regional comprehensive railway logistics hubs, including the functions of transport, warehousing, distribution, information service, etc. in the developed cities, province's capital, regional centres, important ports of entry, important ports or important railway nodes to reduce lead time and integrate resource. According to the geographic feature, transportation infrastructure situation and economic development status, the provinces that have already operated the China Railway Express should be uniformly divided into different regions by China Railway Corporation. A region includes two to four provinces, the railway logistics service is uniformly operated by one regional logistics hub, which means that the neighbouring provinces' China Railway Express projects should be merged into one. In one region, one China Railway Express company is responsible for all international railway transportation services, including collecting cargo, transportation, warehousing, distribution, etc., which can avoid inadequate cargo and vicious competition. And all regional logistics hubs should coordinately develop with each other. In addition, the information system is very important, China Railway Corporation should cooperate with foreign railway ministries to the information exchange mechanism to strengthen the entire process monitor. The countries along the routes of China Railway Express should draw the complete operation routes, and reduce the transportation time.

Global Economy

The Belt and Road Initiative, the full name is called as The Silk Road Economic Belt and the 21st-century Maritime Silk Road, which objective is promoting the economic development between Asia and Europe. Eurasia is the largest continent on earth, which has a 75% population of total and 60% Gross National Product of the world. Asia is an active economic area, and Europe is a developed economic area, there is an area with huge economic development potential between Asia and Europe, especially the countries along The Belt and Road Initiative. These countries have rich natural resources and development potential, which has great cooperation expectations and opportunities. The blooming economic trend will lead the prosperous market, which promotes the development of relevant industries and creates occupation opportunities. Since The Belt and Road Initiative established, Chinese government consecutively set up the Silk Road Fund and Asian Infrastructure Investment Bank to promote Asian economic development, which provides the financial support of infrastructure construction, development and industrial cooperation. In the framework of The Belt and Road Initiative, the countries should strengthen cooperation and communication, sign the trade agreement and build the economic partnership through negotiations. The Chinese government should strengthen investment in foreign, help foreign countries build a series of macro-engineering to encourage regional economy, such as the China-Pakistan Economic Corridor. It will bring huge economic benefits. In addition, the countries along The Belt and Road Initiative should closely collaborate in the financial crisis, which is good at encouraging economic recovery. In the financial crisis, all countries should take part in reforming the global financial structure, which will be able to guarantee stability and prosperity for the world economy.

Infrastructure Connectivity

The train must operate on the track, which is one of the limitations of railway transportation. In the operation of China Railway Express, the construction of the railway network is rather significant. In the domestic, the government should improve and complete the railway network connectivity and transportation performance, especially the blank area of the railway network and old infrastructures and equipment. For the foreign railway network, the Chinese government should strengthen cooperation with countries along The Belt and Road Initiative

to promote foreign railway construction and improvement. In the foreign railway network, the related infrastructures including railway stations of ports of entry and transshipment should be upgraded, which will promote the domestic and foreign railway networks to smoothly connect and improve the customs process.

In the above, the author already mentions that the government should set up the regional logistics hubs to support the development of China Railway Express. However, centred on logistics hubs, the government also needs to set up a series of logistics infrastructures, which will support the development and operation of China Railway Express. The smooth supply chain needs the high-efficiency cooperation of every process. Due to the limitation of railway transportation, it cannot provide a “door-to-door” service. When the cargo arrives at the destination, the follow-up services need the support of other transport models. For the railway location of logistics hubs, it should be near the airports, ports, railway stations, or car freight stations, which will promote comprehensive development for intermodal and improve transportation efficiency. In addition, following the foreign railway routes, railway nodes and trade scales of China Railway Express, China Railway Express should establish a series of logistics hubs in the foreign countries, which improves its logistics capacity including cargo collection and distribution in the foreign countries.

Type of Investment and Collaboration Mechanism

Based on multilateralism and market-based rules, Chinese governments and foreign governments should encourage and apply the financial investment institutions such as Asian Infrastructure Investment Bank and Silk Road Fund to construct passages and nodes of China Railway Express within the prescribed scale of the business, and invest the prevention and control of main diseases of animals and plants. Chinese government applies various investment and financing funds to encourage domestic fund institutions to “Face Global” and support the construction of China Railway Express by means of equity investment and debt financing. Governments should increase the support of the government budget investment for the construction of the domestic section of the China Railway Express channel. At the meantime, attracting social capital investment, encouraging railway industry, local governments, and enterprises to jointly fund the construction and share with the investment income. The multiple investment channels will lead to the new collaboration mechanism, which brings more investment and intelligence. In the new collaboration mechanisms, all parties positively invest and operate China Railway Express and build the mutual supervision mechanism, which can promise the operation process to be visible and clear. It will encourage other investors' confidence. In addition, the Chinese government should complete the relevant laws and rules for investment in foreign, which improves the investment convenience for Chinese enterprises. If necessary, the Chinese government can apply diplomacy channels to encourage investment communications.

Railway Development Plan

The development plan is a general direction and comprehensive guideline for China Railway Express, which will influence its development in the long term. The development plan should cover related parts. The policies coordination, resource integration, market support and infrastructure connectivity etc. already mentioned in the above. Furthermore, according to the development status of China Railway Express, its plan should also focus on the following. Extending to a comprehensive railway operator. At present, China Railway Express focuses on the international container railway transportation, which is the current major business. With the development of China Railway Express, China Railway Express should make itself to be a comprehensive service provider, including freight, post-service, and passenger transport. China

Railway Express should expand its business to the post industry in countries along The Belt and Road Initiative. According to the feature of post and cargos' transport method, China Railway Express will simplify the process of international post service, especially the customs process and transportation time. Trains play a remarkable role in tourism. There are some classical tourism projects that are operated by train, such as Orient Express and Eastern & Oriental Express. The countries along The Belt and Road Initiative cooperate to build classical tourism products and routes with the culture of Silk Road. The countries along The Belt and Road have abundant tourism resources, and the demand of the Chinese tourism market is increasing, which has a great expectation to them all.

Integration of the transportation process, building a digital China Railway Express. China Railway Express needs to constitute the information system that includes a logistics information system and digital monitor system. The government should integrate the domestic information resource that comes from related industries, departments and enterprises to establish the information service system of China Railway Express. Based on the constituted information system, Chinese government cooperates with countries along The Belt and Road Initiative to achieve the information exchanging and sharing including railway, customs and quality supervision, inspection and quarantine, etc., which will set up the information chain to China Railway Express. Based on the information system, the Chinese government should negotiate and cooperate with countries along The Belt and Road Initiative, sign the agreements to simplify the customs process, which promotes the integration of customs clearance in the domestic and foreign.

Safety

Safety is one of the critical factors to measure the performance of railway transportation. The government and railway operators should present a series of measure to keep the safe logistics process. Firstly, the safety of cargo and transportation. For cargo and transportation safety, setting up to an intelligent monitoring system, which will monitor the train's status and cargo's safety. Applying the BeiDou Navigation Satellite System to monitor the present situation of trains, which improve the overall monitoring capability of the train in the transport process. The operators can install the security and intelligent anti-theft measures on the containers, which can protect cargo in the safe state. Secondly, regional safety. The regional safety provides a stable operating environment, especially the regions along the routes of China Railway Express. In the countries along In The Belt and Road Initiative, China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, and Uzbekistan are the members of the Shanghai Cooperation Organization, which focuses on the cooperation on security, military activities, economic cooperation and cultural cooperation. In the security cooperation, these countries focus on anti-terrorist, fighting crime and drug trafficking as they face with the main threats of terrorism, separatism and extremism. Meanwhile, the Chinese government should strengthen its communication and cooperation with other international government to sign the related security cooperation agreement and set up a safety cooperation mechanism for China Railway Express.

CONCLUSION

The objective of this research was to find the factors that influence the success of China Railway Express. The author applied the Analytic Hierarchy Process to find the priority factors. This is a structured technique for analyzing and organizing complex decision by the method of mathematics and psychology. In this case, the author focused on finding the factors that influence the success of China Railway Express, but it has multiple evaluation criteria for

selecting priority factors. The Analytic Hierarchy Process can help the author identify the priority factors and measure the potential outcome. Moreover, the author verified all the hypotheses testing to be valid. According to the total weights of factors and each group's weight, the author selected nine factors as the priority factors to the development of China Railway Express. Based on these selected factors and development status of China Railway Express, the development of countermeasures and suggestions to China Railway Express are presented. These countermeasures are the general development direction. In the real operation, the operators and decision-makers may need to modify them based on the real status.

However, this research still has some limitations. This research only studied the factors that influence the success of China Railway Express. Thus, the data collection only focused on the China Railway Express, not including Chinese domestic railway freight and other transport models. For the background of the respondents, they came from three industries which are academic, government and railway operator. Hence, they could not represent all industries' view. The development countermeasures and suggestions presented to China Railway Express were only the general directions. In different regions, they should be modified based on local development situations. In the future, the research about China Railway Express can be expanded and deepened by including more factors and respondents.

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