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Supply Chain Performance Model of the Rail Freight Business in Thailand

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Abstract:- The objectives of this research are to 1) study the factors influencing the supply chain performance of the rail freight transport business in Thailand 2) analyze the supply chain performance model of the rail freight transport business in Thailand 3) develop the competency model. Supply chain of the rail freight business in Thailand. This research is mixed methods research. The population is 15,728 railroad freight business operators in Thailand, resulting in a total sample population of 460 people and qualitative research. Using a purposive random sampling method, there were 15 people including entrepreneurs and executives. Rail freight business in Thailand. The tool used to collect data is a questionnaire using structural equation modeling techniques.

The results of the research found that 1) factors in planning, procurement, service Shipping side Product return and the performance of the supply chain, it was found that the overall level of opinions at a good level 2) planning, procurement, service Product delivery Product return and supply chain performance. It has a direct influence on the supply chain performance model of the railway freight transport business in Thailand. The index for measuring the level of consistency of the structural equation simulation model is appropriate and harmonious with the empirical data. 2 =318.81 df = 165 2/df = 1.93, RMSEA = 0.047, CFI = 0.99, GFI = 0.93, AGFI = 0.91, and 3) the supply chain performance model of the rail freight business in Thailand should plan to use information technology as a tool in current operations. replaces working in the original way Therefore, entrepreneurs must plan to accommodate changes that will occur in the future. and can continue to compete in business

Keywords:- *Supply Chain Performance: Railway Freight Business; Styling; Train Freight Transport Business Operators*

I. INTRODUCTION

Transportation plays an important role in moving goods from the point of origin of production to the point of consumption. Especially the emergence of diverse consumer behavior needs. Moreover, the resources in each country are different. and not equal Demand for various types of products arises all over the world. International trade began. Transportation plays a role in linking trade routes around the world, providing connectivity, transportation and exchange. Various products have been available for a long time. When the world enters the era of full industrial production The role of transportation is likely to continue to grow. (Martichenko, 2021) Thailand is considered to be one of the countries with a lot of development in the transportation business. There has always been development as a result of the implementation of policies, plans and strategies for economic development continuously until the present. Thailand is a newly industrialized country (Newly industrialized country: NIC). Thailand's product production over the past 20 years has led Thailand to export a large number of products to foreign markets, with the total international trade value in 2021 worth 15.05 trillion baht, and information as of September. Year 2021 There is a total value of international trade of 10.19 trillion baht, respectively, while the gross domestic product (GDP) at current prices, the 2021 projection has a total value of 16.88 trillion baht and the September 2021 projection has a total value of 7.71 trillion baht. baht respectively (Ministry of Commerce, 2021) This shows that Thailand's international trade is the heart of the Thai economic system. The value of international trade is similar in size to GDP and has continued to grow steadily in the same direction as economic GDP, varying according to the global economy and other external factors, but it is something that It is proved that the market value in the export and import sectors is very important. It also has the potential to develop and grow even higher in the future.

Thailand has an economic expansion. Both the industrial sector, the agricultural sector, as well as the service sector cause rapid urban growth and transportation volume. In the past, there was an average annual transportation of goods and services of approximately 805 million tons, with the proportion of transportation modes not keeping up with costs. Due to road transportation with high transportation costs of 2.12 baht/ton-kilometer. Instead, the highest transportation rate was 87.50 percent, while rail transportation had transportation costs of 0.95 baht/ton-kilometer. And water transportation has the lowest transportation cost, which is 0.65 baht/ton-kilometer. Instead, the proportion of transportation was only 1.40 percent and 11.08 percent, respectively, resulting in logistics costs per product. Gross Domestic Product (GDP) remains at a high level of 14.3 percent (of which transportation costs are approximately 7.1 percent of GDP). The government

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therefore invests in developing rail transportation under the Urgent Transport Action Plan (Action Plan) from 2020-2022 with a total amount of 2,252,723.18 million baht, accounting for 74.44 percent of the total amount. Considering the proportion of the investment amount, it is considered consistent with the policy plan that aims for the country to shift from road transportation to using more other types of transportation. By specifying rail transport as the main means of transporting goods and people. From the said investment amount The government has focused on developing the railway system into a double track system on the route. To the region in all regions which is consistent with the situation Conditions of transportation problems The road in question Vehicles and routes and networks At present, most of the country's railways are still single-track systems and can carry only a small load. This causes it to take a lot of time in transportation. As a result, the demand for transporting people and goods is still limited. In addition, it is the use of the budget for the construction of high-speed trains. and develop mass transit systems in the central provinces of various regions, which will result in the rail system playing a greater role in transportation in the future. Railway logistics business Relying on technology that requires a very high amount of money to develop logistics business processes in rail transport, such as planning, arranging lines, and controlling various activities, transporting goods, and distributing goods. From the producer to the consumer According to the needs of consumers, etc., the State Railway of Thailand administration does not allow the private sector and the public to participate. which creates potential in the business of the State Railway of Thailand. From the reasons mentioned above The researcher is therefore interested in studying the supply chain performance model of the rail freight business in Thailand, which can be used as a guideline for developing the service of rail freight transport in Thailand.

➢ *Research Objectives*

- To study factors influencing the supply chain
- Performance of the rail freight business in Thailand.
- To analyze the supply chain performance model of
- The rail freight business in Thailand
- To develop a supply chain performance model of the
- Rail freight business in Thailand.

➢ *Expected Benefits*

- For academic purposes, use as a guideline for studying and developing supply chain performance. in the marketing and transportation of railway freight and can be applied in operational research to provide a wider range of services.
- To be able to use models of causal relationships that have been used as guidelines for development. Supply chain performance of the rail freight business Including planning, sourcing, providing services, delivering products and returning products. To be consistent with the needs of the people as a result, the performance of rail freight transportation is generally accepted throughout the country and abroad.

➢ *Research Conceptual Framework*

Research on Supply chain performance model of the rail freight business in Thailand the researcher has reviewed the literature related to the relationship of the variables used in the research as follows: Supply chain planning and performance Ruthee Banomyong, (2017), Bolstorff and Rosenbaum (2003), Burt et al.

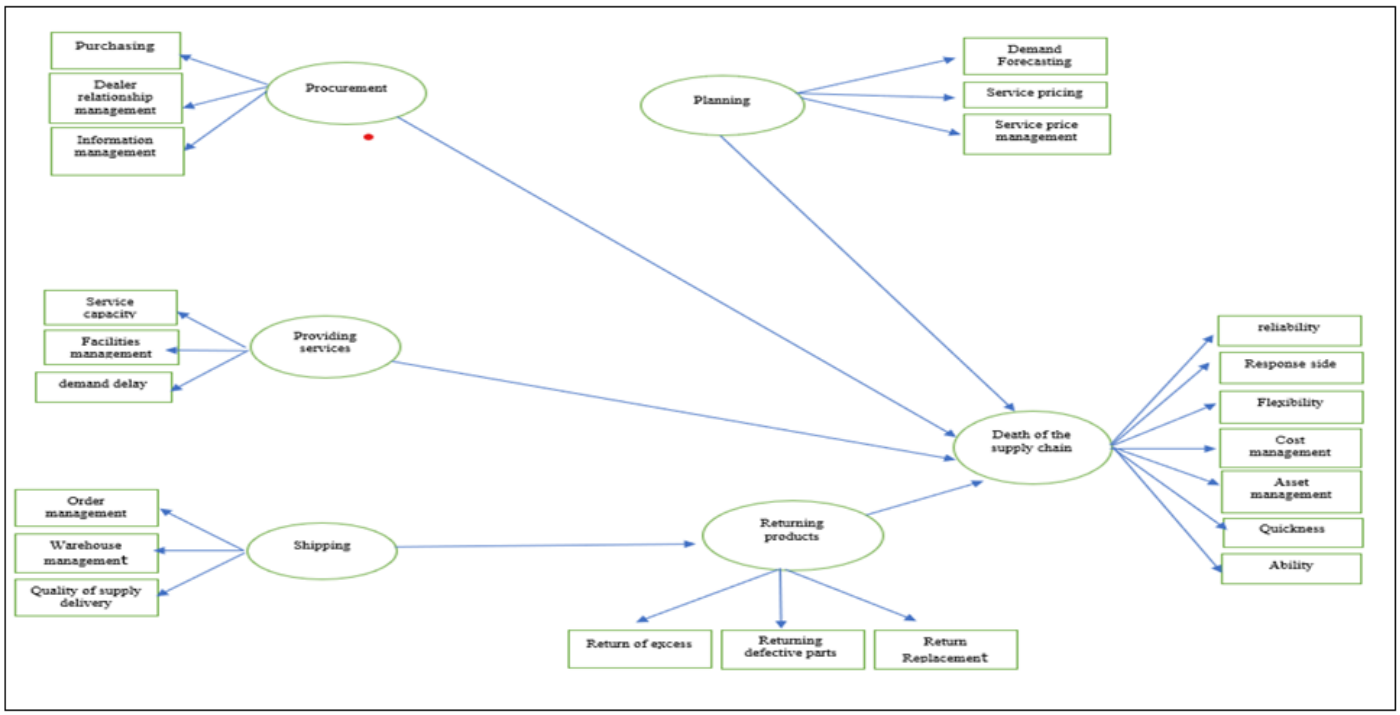

Fig 1 Research Conceptual Framework

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II. LITERATURE REVIEW

This research the researcher reviewed relevant literature from the concept. Various theories and research can be used to determine the issues and conceptual framework of the research as follows.

➢ *Concepts About Supply Chain Performance Definition of Supply Chain Performance*

The supply chain consists of every step involved. directly and indirectly towards responding to customer needs This is not only in the part of manufacturers and raw material suppliers only. But it also includes transporters, warehouses, middlemen and customers. including within each organization's own organization (Chopra, S. & Meindl, P., 2016, p. 13)

The objective of the supply chain is to maximize overall value. Value in the supply chain has created that is the difference between the end product to the customer and what the chain Supply has been used to satisfy the needs of that customer. For most business supply chains Value is related to the profitability of the supply chain, that is, the difference between the revenue received from customers and the overall costs of the supply chain (Chopra, S. & Meindl, P., 2016, p. 15)

Supply Chain Management (SCM) refers to the collection and cooperation of all organizations. and activities in the supply chain to match and be consistent with the processing in production and the flow of raw materials to the consumer. This is managed by a good flow of information from upstream to downstream (Handfield, R.B. & Nicholas Jr., E. L., 2002).

Supply chain management refers to the process of working together efficiently between raw material suppliers, manufacturers, storage facilities, and stores to produce and ship products. in the correct amount Correct location and correct time using the lowest cost at the same time Able to create satisfaction or respond to customer needs. (Simchi-Levi, Kaminsky, P., & Simchi-Levi, E., 2004) Measuring general supply chain performance, it is divided into 3 areas (Lankford, W.M., 2004)

- Efficiency aspect by giving importance to the lowest cost. By reducing inventory costs or other expenses related to the cost of the company's good products is that there is a high inventory turnover rate
- Responsiveness, which will be measured by lost sales resulting from inventory reduction. Good supply chain management must respond to market uncertainties and rapidly changing customer demands.
- Effectiveness aspect Effective supply chain management is related to creating value for customers, known as the "Value Chain", which Effectiveness of supply chain management will give importance to creating Value Chain rather than reducing inventory costs and increasing cost efficiency. It will be the lowest cost-reducing efficiency measure.

➢ *Concepts for Measuring Supply Chain Performance*

From a review of literature related to supply chain performance measurement. It was found that various academics have studied and discussed the measurement of supply chain performance in various industries as follows:

Duangphan Kritchanchai (2014: 12) said that any operation of an organization that wants to change It can be improved. It is necessary to have performance measures that will indicate operational status and results. These performance indicators can communicate with each other among members. It also serves as a valuable tool for coordination between all members within the supply chain.

Palevich (1999: 57) stated that in measuring the performance of a supply chain is a measurement that evaluates whether how can supply chain management help reduce costs for organizations? Currently, most industries have supply chain management costs 75% of total operating costs. There are many types of tools used to measure supply chain performance.

Beamon (1999: 275-276) divided performance measurement in supply chain into 2 types, consisting of qualitative measurement. and quantitative measurement In addition, performance measurement is divided into 3 categories: resources, outputs and flexibility.

Coronado (2010: 67-68) studied the supply chain of the avocado production industry in Mexico. The measure of supply chain performance consists of product quality and efficiency by measuring both performance that has been accepted (perception performance) from executives of the manufacturing plants and performance from actual practice. by measuring the average of the overall sales price and the quality of the output.

From what has been said above Therefore it can be concluded that concepts for measuring supply chain performance from both domestic and international research. There are many research studies using the Supply Chain Operation Reference Model (SCOR Model). In addition, the measurement and evaluation of supply chain performance consists of the following observable variables: Reliability responsiveness, cost, flexibility and assets

➢ *Service Relationships and Supply Chain Performance*

Hugos and Thomas (2006: 77-79) stated that negotiations with suppliers are based on the trustworthiness of members in the supply chain. To send information about customers' purchasing needs to manufacturers. Each supply chain has goals for product production. Design and structure of various parts produced by small enterprises and has reliable standards It has relatively few errors and can be assembled into finished products. Additionally, inventories can be properly stored by local supply chains. This results in the need to reserve large quantities of products. In this regard, customers can receive products quickly and have a reserve of products ready to deliver according to orders from the joint warehouse system or postpone the delivery time. Therefore, designing quality products from cooperation in

design. Sourcing and manufacturing plants This allows products to be delivered to the market efficiently. They have faster delivery times and lower costs.

Vickery (2007: 643) stated that the relationship between production ability Business performance and business cooperation Forms of relationships include Accurate measure of productivity Changing the pattern of the relationship between ability and production performance Improving the standards and components of performance in measuring production ability was found. There is a relationship between the strategic model and the implementation of the strategic plan. This can shape the strategic relationships of the business. Productivity and business performance by using appropriate measures and increasing competitiveness.

Agudelo (2009: 68) states that the cement industry's production processes are highly automated and continuously operated to achieve maximum performance and lowest cost.

In summary, efficient production and service variables affect supply chain performance variables.

- *Shipping Relationships and Returning Products*

Ross (2008: 142-143) stated that the flexibility of product delivery in the supply chain by expanding transportation routes to keep the volume of goods flowing in line with market growth has resulted in increased inventory levels. More Total purchase cost Increased inventory and product turnover Using delivery routes that have increased distances, which results in the network system increasing the number of delivery service points and bringing in various technologies, making it possible to increase the speed of delivery of desired products. Buy Controlling current operating systems and using new technology allows us to know the amount of inventory and increase our service capabilities. Purchasing demand, order fulfillment assessment Appropriate problem-solving options, increasing cooperation in operating according to the strategic plan, responsiveness, and the amount of funding not specified in the plan.

Lindner (2009: 23) stated that delivery flexibility is the organization's ability to adjust the delivery time to meet customer orders. which includes Just-in-time delivery Reliability of shipping, quality of shipping, warehousing management and service provision.

Pretorius (2010: 72-73) stated that the results of the study of the effectiveness of drug control of Platinum Health Pharma Company. In South Africa it was found that The criteria for transporting medical supplies were followed with efficiency at a rate of 88 percent.

Baker (2008: 47) stated that the role of transport hubs includes the ability to shape the business model. Strategic possibilities for reducing inventories Reducing shared risk in the supply chain Determination of inventory quantities and appropriate warehouse management.

Christopher and Peck (2003) stated that when there are many options for providing logistics services from raw material suppliers, Buyers may be prepared to waste a day or two of lead time on their order. In exchange for delivery reliability or in exchange for completed orders with better payment terms.

In summary, effective delivery variables directly influence supply chain performance variables.

- *Relationship of Product Returns and Supply Chain Performance*

Boukani and Boufaim (2010: 2262-2263) stated that reverse logistics management is a concept of providing customer service to complement the factory production system, returning goods through stores and transporting goods back. to factory by sorting product types coordination costs Handling costs and transportation costs the purpose of reverse logistics is to return products. Storage and distribution of products in each industry to efficiently meet customer needs, provide product return services, transportation systems, warehouse systems, and rental systems.

Ruthie Banomyong (2017: 28) said that the elimination of waste from the production and distribution process or packaging Products and raw materials will be put through a classification process to be sent for destruction. Partially reused or remanufactured.

In summary, product return variables Defective products can be resolved. Respond to customer needs and create consistent satisfaction that affects supply chain performance.

- *Related Research*

Zhou (2003) "The Role of Supply Chain Processes and Information Sharing in Supply Chain Management. The study found that the performance of the supply chain process operational reference model and dynamic supply chain information sharing influence the balance of business performance in the manufacturing industry. In this regard, sharing information It does not have a direct influence on business performance. The effectiveness of supply chain processes has a positive influence on business performance. There are 5 performance measures: cost, flexibility, logistics responsiveness and financial returns.

Patel (2004) nyuso Performance Measurement and Evaluation of SupplyChain: The Indian Automobile Industry The study found that Performance measurement and assessment of supply chains in the Indian automobile industry. using a reference model for operations in the supply chain Balanced Index Factors used in the evaluation are divided into 7 groups as follows: industrial plants and inventories, transportation, customer satisfaction, financial performance, time, relationship management between buyers and suppliers of raw materials, information management.

Artamonov (2006) studied the topic "Application of Distributed Simulation in Supply Chain Management". The results of the study found that working together various drivers and information sharing throughout the supply chain

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for application in inventory production systems Distribution side of the supply chain by important conditions It consists of the level of trust of members in the network. The ability to exchange information and define clear objectives for joint operations. Agreement on cooperation between members Ability to use technology and share knowledge to jointly develop skills of operations and analysis.

Robertson (2006) The Impact of Supply Chain Process Integration on Business Performance. A study of the positive impact of supply chain management processes in large global companies in the food and beverage business. Petroleum Electronic machinery and wholesale business to improve customer service performance Supply chain performance measures include profitability, flexibility, delivery lead times, cash flow and logistics performance.

➢ How To Conduct Research

- Research Model: Mixed Methods Research Model Between Quantitative Research and Qualitative Research (Creswell, 2005; Creswell & Plano, 2007)
- Quantitative research uses questionnaires. were the researcher will distribute questionnaires to sample groups.
- Qualitative research uses in-depth interviews using the Purposive Selection method. Then the results are interpreted to be consistent with the empirical data.
- Population The population used in this research includes entrepreneurs registered with the Department of Business Development and the Ministry of Commerce. Total number: 15,728 (Department of Business Development, Ministry of Commerce, 2022)
- C. Research Tools is a Questionnaire Created for Use in Collecting Primary Data (Primary Data) Consisting of 3 Parts as follows:
- Part 1: General information of the respondents. It consists of two questions: the number of businesses and the geographic region of the businesses. The question is closed in nature.
- Part 2: Supply chain operations consist of 5 areas: planning, procurement, service provision, and product delivery. and returning products the questions are in the form of a rating scale with 5 answers: best, good, fair, improved, and most in need of improvement. and there are scoring criteria of 5, 4, 3, 2, 1 respectively.
- Part 3: Supply chain competency consists of 8 areas: reliability, responsiveness, flexibility, and asset management. Managing costs, speed, quality and capability the questions are in the form of a rating scale with 5 answers: best, good, fair, improved, and most in need of improvement. and there are scoring criteria of 5, 4, 3, 2, 1 respectively.

➢ *Data Collection: this Research has Collected Data.*

Using the research questionnaire that has been created as a tool for collecting data. There are the following steps:

- Prepare a questionnaire according to the sample number. Request a letter from Bangkok Thonburi University To request cooperation and assistance from executives and entrepreneurs from railroad freight forwarding establishments. To collect data for use in research.
- The questionnaires were sent by mail (by mailing method) to the sample groups used in the research.

III. DATA ANALYSIS

- Analysis of general data of the sample using descriptive statistics, presenting frequencies in tables and percentages using the SPSS program.
- Analysis of observed variables used in the sample model with descriptive statistics, presenting the arithmetic mean. standard deviation and distribution coefficients, intensity values, and kurtosis values of each variable using the LISREL program.
- Statistics used to analyze data: The statistics used in the data analysis of this research are as follows (Kanlaya Wanichbancha,
  2013: 119-121)Qualitative research: Informants and data sources used in qualitative research can be divided as follows:
- Collection of information from entrepreneurs Executives of the rail freight business by using the method of purposive sampling, which selected samples from establishments or businesses of 3 sizes in order to avoid overlapping sample groups (Suchat Prasitratsin, 2013: 193-194) by sending an interview form. to entrepreneurs in establishments or businesses of the railway freight transport business.
- Secondary data sources Obtained from researching documents from theoretical concepts, dissertations, theses, articles, and various research studies, etc.
- In-Depth Interview of entrepreneurs and executives of the Rail freight business in Thailand is a study of only some issues. To
  help enhance the accuracy of quantitative research. and completeness increases even more.

IV. RESEARCH RESULTS

➢ *Results of general data analysis of respondents*

Table 1 Shows the General Information of the Respondents

General information	Quantity	percentage
Size of your business		
small business	365	79.35
medium sized business	53	11.52
large business	42	9.13
sum	**460**	**100.0**
Business for which you are responsible Located in which region		
Bangkok	6	1.30
Central region (excluding Bangkok)	110	23.91
North	102	22.17
Northeast	162	35.23
South	80	17.39
sum	**460**	**100.0**

From Table 1, it is found that the size of the businesses of the entrepreneurs who responded to the survey consisted of 365 small businesses, accounting for 79.35 percent, 53 medium-sized businesses, accounting for 11.52 percent, and 42 large businesses. People accounted for 9.13 percent**.**

Most of the entrepreneurs have businesses located in the northeastern region, 162 businesses, accounting for 35.23 percent, have businesses in the central region. (Excluding Bangkok) there were 110 businesses, accounting for 23.91 percent, there were 102 businesses in the northern region, accounting for 22.17 percent, there were 80 businesses in the south, accounting for 17.39 percent, and there were 6 businesses in Bangkok, accounting for 1.30 percent respectively

Table 2 Shows the Average Values. Standard Deviation Opinion
Level of the Sample Group on Various Factors in the Overall Picture

Factor	Opinion Level		
	$\bar{X}$	S.D.	Interpret Results
Planning aspect	3.88	0.40	fair level
Procurement side	4.38	0.42	Good level
Service aspect	4.32	0.47	Good level
Shipping side	4.35	0.41	Good level
Product return	4.00	0.41	Good level
Supply chain performance	4.23	0.57	Good level

From Table 2, it is found that the level of opinions of the sample groups on various factors. Overall, it is at a good level. In terms of procurement, it is at a good level ($\bar{X}$= 4.38, S.D. = 0.42). In terms of product delivery, At a good level ($\bar{X}$= 4.35, S.D. = 0.41) in terms of service at a good level ($\bar{X}$= 4.32, S.D. = 0.47) in terms of supply chain performance. It is at a good level ($\bar{X}$= 4.23, S.D. = 0.57) in terms of product returns. At a good level ($\bar{X}$= 4.00, S.D. = 0.41) and planning is at a moderate level ($\bar{X}$= 3.88, S.D. = 0.40), respectively

Table 3 Shows the Average Values. Standard Deviation of Planning Factors

Planning Aspect	Opinion Level		
	$\bar{X}$	SD	Interpret Results
Demand Forecasting			
1. Able to predict demand for equipment in accordance with the budget	4.08	.69	Good level
2. Able to predict the need for expert personnel in line with the budget	4.13	.54	Good level
3. Able to predict demand for facilities in work consistent with the budget	4.49	.52	Good level
sum	**4.23**	**.50**	Good level

From Table 3, it is found that the variables in the group of observed variables in planning Overall, respondents had opinions about planning. At a moderate level ($\bar{X}$= 3.88, SD=0.40)

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Table 4 Shows the Average Values. Standard Deviation of Procurement Factors

Procurement side	**Opinion level**		
		SD	**Interpret results**
Purchasing			
1. Able to purchase products and equipment in quantities consistent with needs	4.38	.62	Good level
2. Able to purchase products and equipment at prices consistent with needs	4.40	.65	Good level
3. Able to purchase quality products and equipment consistent with needs	4.43	.57	Good level
sum	**4.41**	**.47**	**Good level**
Managing distributor relationships			
1. Distribute products and equipment that have been selected and have appropriate properties consistent with needs.	4.23	.57	Good level
2.Selected distributors can ship products. and equipment in line with needs	4.34	.50	Good level
3. Selected distributors can replenish products in line with demand.	4.09	.57	Good level
sum	**4.22**	**.35**	**Good level**
Information management			
1. There is a process for communicating information efficiently. Fast according to needs	4.39	.64	Good level
2. There is a complete process of communicating information as required	4.56	.61	the best
3. There is a process for communicating information efficiently. It is accurate according to your needs	4.59	.56	the best
sum	**4.51**	**.49**	the best

From Table 4, it is found that the variables in the group of observed variables on the procurement side Overall, respondents had opinions about procurement. At a good level ($\bar{X}$ = 4.38, SD=0.42)

Table 5 Shows The Arithmetic Mean. Standard Deviation And Distribution Coefficient
Skewness And Kurtosis Values Of The External Latent Variables On The Supply Side. Of The Sample

External latent variables	**average arithmetic**	**Deviation standard**	**Skewness**	Prominence	L level comment
Procurement side 1. Purchasing	3.672	0.464	0.456	-0.124	a lot
2.Relationship management with distributors	3.880	0.441	0.269	-0.091	a lot
3.Information management	3.748	0.413	0.279	-0.479	a lot

From Table 5, it is found that the distributor relationship management variables Has a high level of arithmetic mean. Information management. and purchasing the arithmetic mean values are similar at a very high level. Supply variables They have similar standard deviations, with values between 0.413 - 0.464. All 3 aspects of procurement variables have similar values of skewness and kurtosis which do not consider signs, with values of skewness between 0.279 - 0.456. and the kurtosis value is between -0.091 - 0.479

➢ *Results of the in-Depth Interview*

The researcher arranged for in-depth interviews to address issues related to this model. To prove or confirm empirically whether the model presented by the researcher is consistent with the reality that occurs in the supply chain performance model of the rail freight business in Thailand or not, the results are summarized. that the model presented by the researcher is a model that reflects various factors that affects the performance pattern of the actual supply chain of the rail freight business in Thailand which is of the same opinion that various factors Whether it is planning, sourcing, providing services, and delivering products. Returning products All of this has resulted in pushing the efficiency of the supply chain of the rail freight business to be another option for transportation that is low cost and safe. To increase the capacity of Thailand's railway transportation services. and to support being a logistics center.

V. CONCLUSION

From the study, the researcher was able to summarize and discuss the results as follows.

➢ *Hypothesis 1:*

Planning has a direct influence on supply chain performance. of the rail freight business Planning has a direct influence on supply chain performance equal to 0.31, that is, the job satisfaction variable has an overall effect on the variable of good employee behavior with an influence equal to 0.34, which is consistent with the planning concept. Distribution should include: Providing transportation and service (Chattayaporn Samerjai and Thitinan Wariwanich, 2018, page 174) and consistent with the results of qualitative research that was found Product management planning It should be consistent with procurement operations. Delivery andmeet the demand to provide timely care to high-risk patients.

➢ *Hypothesis 2:*

Procurement has a direct influence on supply chain performance. of the rail freight business Procurement has job characteristics that have a direct influence on the performance of the supply chain equal to 0.25. Jain, Girotra, and Netessine (2013) found that variables that have a direct influence on the performance of procurement of raw materials include: Procurement from abroad and sourcing from a variety of suppliers and in addition, the results from the study of Hieu (2010), It was found that it was not possible to directly compare the relationship between the observed variables in procurement and service provision. But the study of indirect effects found that procurement and service variables had a significant impact on supply chain performance variables between departments within the organization.t was found that it was not possible to directly compare the relationship between the observed variables in procurement and service provision. But the study of indirect effects found that procurement and service variables had a significant impact on supply chain performance variables between departments within the organization.

➢ *Hypothesis 3:*

Service provision has a direct influence on supply chain performance. of the rail freight business Providing services has a direct influence on the performance of the supply chain, equal to 0.19. Providing services has a direct influence on the performance of the supply chain. Consistent with the study of Chow et al. (2008), variables that have a direct influence on supply chain performance and supply chain design of middle management in the United States were studied, including: Quality and service variables Operational and distribution variables and from the study of Recha Chusuwan (2017), it was found that the variables that have a direct influence on the core competencies of educational area directors are the variables of adaptation and flexibility. and coordination variables

➢ *Hypothesis* 4:

Product delivery It has a direct influence on the performance of the supply chain. of the rail freight business Shipping It has a direct influence on the performance of the supply chain equal to 0.27 in terms of product delivery. It has a direct influence on product delivery. Perform work which is in line with the studies of Supattra Mueanchanchoei. and Duangpankritchanchai (2017) who found that the railway freight transport business in Thailand the supply chain system has never been used in management. As a result, the service system is quite slow. And there were quite a few problems.

➢ *Hypothesis 5:*

Product delivery It has a direct influence on product returns. of the rail freight business Shipping It has a direct influence on product returns equal to 0.33, followed by product delivery variables. With a direct influence equal to 0.27, product delivery It has a direct influence on product returns. Order management Warehouse management and quality of supply and delivery according to the plans and objectives that have been set the results of the research were found to be consistent with the study of Chayakarn Maliwan (2017) who found that satisfaction from product delivery has a direct influence on customer satisfaction from receiving service. After consolidating warehouse operations and according to a study by Skoglund (2012), it was found that the decision to procure weapons for the Swedish army uses four types of logistics decision principles, deciding the balance between efficiency or effectiveness. and decision.

➢ *Hypothesis 6:*

Returning goods It has a direct influence on the performance of the supply chain. of the rail freight business Returning products, it has a direct influence on the performance of the supply chain with a value equal to 0.14. Product return variable It has a direct influence on the performance of the supply chain. Consistent with the results of the study by Kotzab et al. (2005), it was found that the observable variables that have a direct influence on the financial supply chain performance of various industrial plants in Germany includes the variable product returns, which It consists of the following observable variables: product returns after sales in theafter sales over the past 3 years, which is at a fair level.

➢ *Hypothesis 7:*

Procurement has a direct influence on planning of the rail freight business Procurement has a direct influence on planning with a value equal to 0.53. Procurement has a direct influence on planning. It was found that the research results are consistent with the study of Chayakarn Maliwan (2017). It was found that satisfaction with product returns was Indirect influence on customer satisfaction from receiving service After consolidating warehouse operations and results from the study of Veerakachen (2006), which found that variables that directly influence the impact variables of reverse logistics performance

SUGGESTIONS

Results from this research It was discovered that the model of the supply chain performance of the railway freight transport business is consistent with empirical data and can be applied to develop the supply chain performance of the rail freight transport business. with recommendations from the use of research results and future research as follows:

➢ *Suggestions from the Use of Research Results*

- The most important variables which the business of transporting goods by rail It should be used to develop operations first, namely planning. From the study it was found that Planning variables directly influence service delivery variables. at the best level. In addition, planning variables have a direct influence on procurement variables. And the delivery aspect is at the best level.
- The second variable that the rail freight business should pay attention to and use in its operations is product delivery. The results of the study found that Shipping variables have a counterproductive influence on the performance of the supply chain It is a direct influence and delivery variables have a direct influence against returns. At a fair level and delivery variables also have an

overall influence on supply chain performance. and the return side, therefore, the business of transporting goods by rail Therefore, product delivery operations should be developed to meet customer needs.

- Rail freight businesses should improve their supply chain performance in cost management, asset management. Reliability and responsiveness. This is because results from research found that the rail freight business that has a fair level of supply chain performance in cost management and besides of the rail freight business Many have adequate property management and reliability and responsiveness.

➢ *Suggestions For Future Research*

- This research is a study using both research methods together: Quantitative research methods and qualitative research Therefore, in the next research, it should be studied using qualitative research methods. Using a focus group discussion method to gain more in-depth information and to compare it with research using both quantitative and qualitative methods.
- This research is a study of the performance of the supply chain of the rail freight business throughout the country. Therefore, there should be a separate study of the business of transporting goods through other channels, such as transporting goods by truck. air cargo transport Transportation of goods by ship, etc.

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