FACTORS INFLUENCING EFFICIENCY OF CROSS-BORDER TRANSPORT MANAGEMENT SYSTEM USING RFID SENSOR TECHNOLOGY IN CROSS-BORDER TRANSPORT MANAGEMENT SYSTEM, NONG KHAI BORDER CHECKPOINT

Varangkoon Issaragura Na Ayuthaya

ABSTRACT

Purpose: This study aimed to examine the factors influencing the efficiency of the cross-border transport management system using RFID sensor technology in the cross-border transport management system, Nong Khai border Checkpoint and develop a Structural Equation Model (SEM) for cross-border transport management system Nong Khai border Checkpoint.

Method: This study was a quantitative study. The sample group consisted of 450 cross-border logistics service providers in Thailand and used a questionnaire to collect data to analyze the data by percentage, mean, standard deviation statistics, Confirmatory Factor Analysis (CFA) and Structural Equation Model analysis (SEM).

Results and Conclusion: The research findings revealed that 1) Service and Performance variables influenced cross-border transport management system at the statistical significance level (p<.05) which was consistent with the theory. The observed variables had component weights between 0.241 to 0.79 and were significantly different from zero at the 0.01 level for 11 variables, one variable different from zero at the 0.05 level, and the reliability values of latent variables were between 0.058 - 1.153 and 3) The harmonization of models based on assumptions and empirical data and found that all thresholds were within the acceptable (pass) criteria, Structural Equation Model analysis (Chi-Square = 44.113, df = 35, p = 0.139, RMSEA = 0.026, GFI =0.026, AGFI = 0.960).

Research Implications: In order to have satisfied or effective service level, cross-border transport management system using RFID sensor technology in Cross-border Transport Management System must have a one-stop service to fulfil all the requirement to cross the border of all vehicles every day, the service must be done in a speedy manner. For the service itself, it has to be reliable and service with equitability and adequate.

Originality/Value: This research provides the knowledge and practice for Cross-border Transport Management System, Nong Khai Border Checkpoint locating at Thailand and Laos borders to improve its facility, infrastructure as well as its service component to meet the requirement of logistics companies that use the service.

Keywords: Cross-border Transport Management, RFID Sensor Technology, Border Checkpoint.

FATORES QUE INFLUENCIAM A EFICIÊNCIA DO SISTEMA DE GESTÃO DO TRANSPORTE TRANSFRONTEIRIÇO UTILIZANDO A TECNOLOGIA DO SENSOR RFID NO SISTEMA DE GESTÃO DO TRANSPORTE TRANSFRONTEIRIÇO, NONG KHAI BORDER CHECKPOINT

RESUMO

Finalidade: Este estudo teve como objetivo examinar os fatores que influenciam a eficiência do sistema de gestão de transporte transfronteriço usando tecnologia de sensor RFID no sistema de gestão de transporte transfronteriço, Nong Khai border Checkpoint e desenvolver um Modelo de Equação Estrutural (SEM) para o sistema de gestão de transporte transfronteriço Nong Khai border Checkpoint.

Método: Este estudo foi um estudo quantitativo. O grupo de amostra consistiu em 450 provedores de serviços logísticos transfronteriços na Tailândia e utilizou um questionário para coletar dados para analisar os dados por

1 Rajamangala University of Technology Thanyaburi, Thailand. E-mail: varangkoon_i@rmutt.ac.th
Orcid: https://orcid.org/0000-0001-6511-4672
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porcentagem, média, estatísticas de desvio padrão, análise fatorial confirmatória (CFA) e análise do modelo de equações estruturais (SEM).

Resultados e Conclusão: Os achados da pesquisa revelaram que 1) as variáveis Serviço e Desempenho influenciaram o sistema de gestão de transporte transfronteiriço no nível de significância estatística (p<.05) que era consistente com a teoria. As variáveis observadas tiveram pesos de componentes entre 0,241 e 0,79 e foram significativamente diferentes de zero no nível 0,01 para 11 variáveis, uma variável diferente de zero no nível 0,05, e os valores de confiabilidade. de variáveis latentes foram entre 0,058 - 1,153 e 3) A harmonização dos modelos baseados em suposições e dados empíricos e constatou que todos os limiares estavam dentro dos critérios aceitáveis (de passagem), Análise do Modelo de Equação Estrutural (Qui-quadrado = 44,113, df = 35, p = 0 0,139, RMSEA = 0,026, GFI = 0,026, AGFI = 0,960).

Implicações da investigação: Para ter um nível de serviço satisfatório ou eficaz, o sistema de gestão de transportes transfronteiriços que utiliza tecnologia de sensor RFID no Sistema de Gestão de Transportes Transfronteiriços deve ter um serviço único para cumprir todos os requisitos de atravessar a fronteira de todos os veículos todos os dias, o serviço deve ser feito de forma rápida. Para o serviço em si, ele tem que ser confiável e serviço com equidade e adequado.

Originalidade / Valor: Esta pesquisa fornece o conhecimento e a prática para o Sistema de Gestão de Transporte Transfronteiriço, Nong Khai Border Checkpoint localizado na Tailândia e Laos fronteiras para melhorar sua instalação, infraestrutura, bem como sua componente de serviço para atender às necessidades das empresas de logística que utilizam o serviço.

Palavras-chave: Gestão de Transporte Transfronteiriço, Tecnologia de Sensor RFID, Ponto de Verificação de Fronteira.

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1 INTRODUCTION

At present, it can be seen that the application of Internet of Things (IoT) technology is very vital both in the development of various systems, especially in the area of cross-border transportation that is happening in the Thailand 4.0 era [IATA, 2017], with the application of sensors to control real time activities, it has been continuously developed. In particular, the application of low-cost sensors such as RFID to work efficiently and most importantly, lower system costs. At the present time, sensors are widely applied. Border trade between Thailand and Lao PDR is growing steadily [Trading Economics, 2016], whereas Thailand has a border line connected to Lao PDR with the Mekong River as a border line. There are 12 border provinces in the northeastern region with 6 provinces located along the Mekong River. The development of infrastructure and transportation routes that connect easily and quickly were constructed, especially Nong Khai Province, which is the center of connecting the regional economy along the North-South Economic Corridor (NSEC) and the Eastern Economic Corridor (EEC) of the Mekong Regional Economic Cooperation Framework (Greater Mekong Sub-region: GMS) [Asian Development Bank, 2014] from the potential of the infrastructure and logistics of the aforementioned border provinces of various developments, whether in terms of economy, society, culture and national security.

Therefore, research on smart transportation systems to increase safety standards and the potential of cargo transportation with RFID technology on a notification system via a mobile application, which is an integration between RFID sensor technology, smartphone technology, Wi-Fi technology, Web Browser technology and GPS technology applied together with IoT technology to develop prototypes smart transportation system to increase product safety
standards with RFID technology on the notification system via mobile application make traders have more confidence and trust in choosing a smart transport vehicle in the future. There is a development of a low-cost sensor system for alerting the status of goods including tracking the status of the shuttle bus via GPS system in real time, which results in efficiency in speed of work, reduce mistakes in transportation and save transportation costs.

This research will study the efficiency of the RFID technology system of the cross-border transport management system, Nong Khai border Checkpoint on the notification system via mobile application. Due to the aforementioned cross-border movement of goods and goods, there is a statistical trend of increasing cross-border service providers and users. Therefore, this research focuses on factors influencing the operational efficiency of cross-border transport of shuttle service and transport enterprises.

2 RESEARCH OBJECTIVES

In this study, the researchers established the research objectives as follows:
1. To examine the factors influencing the efficiency of the cross-border transport management system using RFID sensor technology in the cross-border transport management system, Nong Khai border Checkpoint
2. From the result of 1, then develop a Structural Equation Model (SEM) for cross-border transport management system Nong Khai border Checkpoint.

3 LITERATURE REVIEW

3.1 Supply Chain

Supply chain or logistics network is the use of systems of agencies, people, technology, activities, information, and resources for moving goods or services from the supplier to the customer. Supply chain activities transform natural resources, raw materials, and other materials into finished goods and then send it all the way to end customer. In terms of the philosophy of the supply chain materials that have been used, they may be recycled at any point in the supply chain. If the materials are recyclable materials, the supply chain is related to the value chain. In general, the starting point of the chain usually comes from natural resources whether it is a biological or ecological resource processed by humans through an extraction process and related manufacturing such as layout construction, assembly or integration before being sent to the warehouse or material warehouse. Every time there is movement, the quantity of products will decrease every time and beyond its origins and finally is delivered to the hands of consumers.

![Figure 1 Supply Chain](Source: Issaragura, 2022)
In the supply chain of each company, not all of these components are required, for example, a Dell computer can be ordered through the company's website produces and delivers products directly to customers without passing through the hands of wholesalers /distributors or retailers at all.

SCOR-Model (Supply Chain Operations Reference) was developed by the Supply Chain Council used to measure the performance of the entire supply chain system. It is a reference process in supply chain management covers supplier's distributor and customer's customer. This includes transportation performance and order fulfillment, product variety, quality assurance and the cost of receiving the item back (poor quality products), material inventory and cash flow, and other factors to measure the overall quality of the supply chain system.

### 3.2 Database

Database is a collection of related data in the same subject. The main purpose of database management is to measure temperature, humidity, and count the number of products loaded in the vehicle counting the number of products loaded into the vehicle. Once it is categorized, it brings out that different information for use. The benefits of a database management system are as follows.

- Able to maintain data accuracy, reduce the use of overlapping resources in data collection.
- Reduce the process of collecting redundant data and some information can appear from many different sources.
- Able to protect and preserve data safely and conveniently for data storage.

### 3.3 Hardware and tools used in research on the development of cross-border freight transport potential. Case study: Nong Khai border checkpoint

The Arduino Uno R3 Micro Controller is the most popular standard board because it is the right size for making a control system and most of them have library projects in various formats that are developed to support various modules, mainly with reference to the motherboard. In this research, various hardware equipment was used, with the details as follows.

- Arduino Uno R3 Micro Controller
- Ublox NEO-M8N GPS Module and Antenna
- RC522 RFID Reader Module 13.56MHz
- LCD (Display)

<table>
<thead>
<tr>
<th>Figure Instrument</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID RC522</td>
<td>Used for identification and tagging, working situations to identify students getting on and off the bus.</td>
</tr>
</tbody>
</table>

Table 1: Hardware tools used in research
Factors Influencing Efficiency of Cross-Border Transport Management System Using RFID Sensor Technology in Cross-Border Transport Management System, Nong Khai Border Checkpoint

<table>
<thead>
<tr>
<th>Researcher and Title</th>
<th>Instrument</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doremoni Mallesh Kumar et al., (2016)</td>
<td>Implemental and Experiments</td>
<td>Designing a transportation safety system for school children based on RFID technology</td>
</tr>
<tr>
<td>Khaled Shaaban et al.,(2013)</td>
<td>Questionnaire</td>
<td>Use questionnaires to collect information on risks and satisfaction.</td>
</tr>
<tr>
<td>Saniah Ahmed et al.,(2015)</td>
<td>Questionnaire</td>
<td>Use questionnaires to collect intangible risk data.</td>
</tr>
<tr>
<td>Vishaka Asundkar et al.,(2016)</td>
<td>Questionnaire</td>
<td>Learn about monitoring and safety monitoring systems for schools and children.</td>
</tr>
</tbody>
</table>

**Source:** Issaragura, 2023

### 4 METHODOLOGY

This is quantitative research. The population of this research is infinite so the researcher selected W.G. Cochran's sampling formula (Cochran, 1977) at a confidence level of 95% to calculate the sample size of cross-border shipping operators between Thailand and Laos to get...
Factors Influencing Efficiency of Cross-Border Transport Management System Using RFID Sensor Technology in Cross-Border Transport Management System, Nong Khai Border Checkpoint

450 samples. Research tool for this was a questionnaire to collect quantitative data with the following steps: (1) Study the principles of questionnaire construction and conceptual framework for research; (2) Study and collect information from books, documents, articles and related research as a guideline for constructing questionnaires of the questionnaire; (3) Define the structure of the questionnaire and the language expression of the question. The questionnaire was constructed and the questionnaire was tested for reliability with 30 try-out samples. The data in the Rating Scale obtained from the Try-Out was analyzed by a computer using a ready-made program to find validity and reliability by analyzing the Cronbach's Alpha Coefficient, the Cronbach's Alpha value was 0.84. The researcher used Confirmatory Factor Analysis - CFA to analyze the equation structure because this confirmatory factor analysis can examine the relationship between variables and test statistical hypotheses. In confirmatory factor analysis, an error may occur if the hypothesis is made with insufficient sample size. The metrics in the questionnaire were wrong, and that the collected data was lost during the analysis process (Stanley, 1992).

5 RESULTS AND DISCUSSIONS

5.1 General information of respondents

Results of general data analysis of respondent companies found that most of the respondents had a type of business without partner companies or companies with joint ventures for 375, representing 53.12 percent, shipping business organizations (general) for 211, representing 29.89 percent, manufacturing business organizations for 78, representing 11.05 percent, business organizations that deliver goods (Specific type) for 35, representing 4.96 percent and Business organizations that provide information services Data and information management for 7, representing 0.99 percent, respectively.

5.2 Influencing factors on service quality in using transportation services

An overview of the sample gives an opinion of the tangibility factor level. The scores were given in descending order as follows: 1) Service from transport personnel with obvious expertise has average of respondents was 3.9, at a high level with a standard deviation of 0.94; 2) There is a clear service price with average of 3.78, at a high level with a standard deviation of 1.04.; 3) Facilities providing such as all-in-one application has average of the respondents of 3.7, at a high level with a standard deviation of 0.97; 4) equipment and technology used in modern transportation has average of 3.64, at a high level with a standard deviation of 1.05; and 5) Transportation equipment is ready for service with the average of 3.41, at a moderate level with a standard deviation of 1.1

5.3 Factors influencing the efficiency obtained in the use of transportation services

The results of the study showed that the overview of the sample gave the opinions of the level of Equitable Services, the scores were arranged in descending order as follows: 1) Determining the current market situation analysis had an average of 4.34, in a very high level with a standard deviation of 0.62; 2) Determining the estimated income statement with an average of 4.28, in a high level with a standard deviation of 0.79; 3) Identification of strengths, weaknesses, opportunities and threats that affect the product line with an average of 4.27, in a high level with a standard deviation of 0.69; 4) Determining the practice program had an average of 4.23, at a high level with a standard deviation of 0.81; 4) The setting of marketing
objectives had an average of 3.94, in a very high level with a standard deviation of 0.91; and 5 (Marketing Strategy with an average of 3.86, at a high level with a standard deviation of 0.92.

5.4 Hypothesis testing results

The researcher has analyzed the components. To verify the suitability and accuracy of the structural equation measurement model by considering the component weights ($\lambda$) and $R^2$ value to examine the covariance of the indicators which can present the results of structural analysis of the measurement model the influencing factor on service consisted of 4 observed variables as shown in Figure 1, Table 1.

![Figure 2](image-url)  
*Figure 2. Structural analysis of the measurement model of influencing factors on the operation of the enterprises. Source: Issaragura, 2023*

<table>
<thead>
<tr>
<th>Correlation Variable</th>
<th>Component Weight</th>
<th>Component</th>
<th>SE</th>
<th>t-value</th>
<th>Sig.</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>Service</td>
<td>0.617</td>
<td></td>
<td></td>
<td></td>
<td>0.380</td>
</tr>
<tr>
<td>Brand</td>
<td>Service</td>
<td>0.648</td>
<td>0.106</td>
<td>8.744</td>
<td>***</td>
<td>0.420</td>
</tr>
<tr>
<td>Reliability</td>
<td>Service</td>
<td>0.643</td>
<td>0.119</td>
<td>8.914</td>
<td>***</td>
<td>0.414</td>
</tr>
<tr>
<td>Tangibility</td>
<td>Service</td>
<td>0.642</td>
<td>0.123</td>
<td>8.636</td>
<td>***</td>
<td>0.412</td>
</tr>
</tbody>
</table>

Structural analysis of the model of factors influencing the efficiency obtained in the use of transport services, 4 variables were observed.
Factors Influencing Efficiency of Cross-Border Transport Management System Using RFID Sensor Technology in Cross-Border Transport Management System, Nong Khai Border Checkpoint

**Figure 3.** Structural analysis of the model measuring influence factors on efficiency obtained in the use of transportation services.

**Source:** Issaragura, 2023

**Table 3.** Structural analysis results of the measurement model factors influencing the efficiency obtained in the use of transportation services, component weight value, validity of the observed variables and component score coefficients

<table>
<thead>
<tr>
<th>Correlation Variables</th>
<th>Component Weight</th>
<th>SE</th>
<th>t-value</th>
<th>Sig.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>Performance</td>
<td>0.421</td>
<td>0.177</td>
<td>0.177</td>
<td></td>
</tr>
<tr>
<td>Equitable</td>
<td>Performance</td>
<td>0.554</td>
<td>0.313</td>
<td>4.112</td>
<td>*** 0.307</td>
</tr>
<tr>
<td>Sufficient</td>
<td>Performance</td>
<td>0.364</td>
<td>0.231</td>
<td>4.066</td>
<td>*** 0.133</td>
</tr>
<tr>
<td>Customer</td>
<td>Performance</td>
<td>0.467</td>
<td>0.307</td>
<td>3.972</td>
<td>*** 0.218</td>
</tr>
</tbody>
</table>

**Source:** Issaragura, 2023

Structural Analysis of the Customer Service Level Measurement Model It consists of 4 observed variables.

**Figure 4.** Model measuring Customer Service Level

**Source:** Issaragura, 2023
Table 4. Structural analysis results of the measurement model factors influencing customer service level, component weight value, validity of the observed variables and component score coefficients

<table>
<thead>
<tr>
<th>Correlation Variables</th>
<th>Component Weight</th>
<th>λ</th>
<th>SE</th>
<th>t-value</th>
<th>Sig.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>On time &lt;--- Service level</td>
<td>0.768</td>
<td>0.589</td>
<td>5.183</td>
<td>***</td>
<td>0.190</td>
<td></td>
</tr>
<tr>
<td>Backlog &lt;--- Service level</td>
<td>0.436</td>
<td>0.114</td>
<td>4.953</td>
<td>***</td>
<td>0.183</td>
<td></td>
</tr>
<tr>
<td>Shortage &lt;--- Service level</td>
<td>0.428</td>
<td>0.106</td>
<td>4.953</td>
<td>***</td>
<td>0.183</td>
<td></td>
</tr>
<tr>
<td>Fulfillment &lt;--- Service level</td>
<td>0.415</td>
<td>0.103</td>
<td>5.322</td>
<td>***</td>
<td>0.172</td>
<td></td>
</tr>
</tbody>
</table>

Source: Issaragura, 2023

The researcher has analyzed the application of RFID sensor technology in cross-border logistics management system, Nong Khai border checkpoint using the Maximum Likelihood method with the AMOS 22 package program to compare the harmony between the developed model and the empirical data. The criteria for verifying the model's consistency with the empirical data. The researcher considers the statistical value. which includes an index value of Chi-Square, χ²/df, CFI, GFI, AGFI, and RMSEA, the analysis was below.

The Model analysis found the following value: Chi-Square = 44.113, df = 35, p = 0.139, RMSEA = 0.026, GFI = 0.026, AGFI = 0.960 is described as follows. The results of the weight analysis of the components of the observed variables found that there were positive values of 12 variables ranging in size from 0.241 to 0.79 and differing from zero at a statistically significant level of 0.01. 11 variables were significantly different from zero. At the statistical level of 0.05, there was one variable. The observed variable with the highest component weight was the reliability factor, the weight value was 0.79, and the joint variance was 1.153%. is equality of services, the weight value is 0.457 and the joint variance is 0.209 percent. Every observed variable (R²), which indicates the covariance of the externally observed variable, is from 0.058 - 1.153.

When considering the standard component weight (λ) for each component, it was found that the observed variable that had the highest component weight were Reliability factors, weight values of 0.79 and 1.153% of common variance, risk analysis, weight of 0.63 and 0.396% of common variance; Input factors in product/brand management, weight of 0.625 and common variance of 0.391%; Intangibility of service, weighted value of 0.642 and a common variance of 0.412%; Order fulfillment rate, weighted value of 0.62 and a common variance of 0.385%; On time delivery, weighted value of 0.568 and common variance of 0.32; Late delivery,
weighted value of 0.506 and common variance of 0.256; *The level of backlog*, weighted value of 0.514 and common variance of 0.568; *Speed and timeliness*, weighted value of 0.586 and total variance of 0.343; *Adequate service*, weighted value of 0.475 and total variance of 0.226; *Customer service*, weighted value of 0.241, and variance of 0.058; and *Equality of services*, weighted value of 0.457 and a common variation of 0.209, respectively.

6 DISCUSSION

In this study, the researchers established the research objectives and discussed the finding as follows:

1. The analysis of general information of respondents showed that the majority of the sample group of executives and operators in the domestic cross-border logistics group have a type of business without trading partners or companies with joint ventures, amounting to 375, representing 53.12%. Most of them focus on a balanced and sustainable competitive advantage, with an average of 4.10 at the highest level. Customer brand loyalty is essential to a business's profitability, which the organization must pay attention to product development or continuous management and the introduction of products or services into the market in order for customers to meet their needs in a timely manner. At the same time, as a whole, executives, supervisors, and operators gave importance at a high level to create the value that customers can get from the organization, it focuses on the management practices of competitive advantages with cooperation in efficiency and production processes, in order to streamline the operations of the cross-border logistics business to create a balanced and sustainable competitive advantage in accordance with the study of Kunjira Phokan (Phogun & Muangkaen, 2017) that the duration of operation, infrastructure and facilities of services are major factors enhancing the satisfaction of consumers.

2. According to Research Objective 1, to examine the factors influencing the efficiency of the cross-border transport management system using RFID sensor technology in the cross-border transport management system, Nong Khai border Checkpoint, the findings revealed that Service Characteristics and Service performance have direct influence on the efficiency of the cross-border transport management system using RFID sensor technology in the cross-border transport management system. The most important elements of Service Characteristics were Reliability, Intangibility, Brand and Risk, respectively. Moreover, the most important elements of Service Performance were Speed, Adequate of service, good customer service, and Equality of service, respectively. In addition, the Service level effectiveness is measured on Able to fulfil the order, On-time delivery which is in line with the study of ESCAP (2015) that technical support, facility and infrastructure for vehicles related to the effectiveness of cross-border transport system in Southeast Asia (ESCAP, 2015), and complied to the study of Moodley (2021) that the top five success factors identified for African cross-border projects are: 1) front-end loading (FEL); 2) top management support; 3) planning, execution and control (including risk management); 4) leadership and establishing trust; 5) stakeholder satisfaction. A model of the success factors and best practices framework for African cross-border projects is proposed. The paper contributes to the development of project execution strategies to improve African cross-border project performance (Moodley, 2021).

2.2 From the result of 2.1, then develop a Structural Equation Model (SEM) for cross-border transport management system Nong Khai border Checkpoint.
The results of the causal effect analysis of the practice guideline of influencing factors on service quality in transport service usage from the causal relationship test can be summarized as follows:

1) The results of the analysis and test of the relationship between service characteristics and the efficiency of cross-border transport management system using RFID sensor technology in Cross-border Transport Management System, Nong Khai Border Checkpoint, the correlation coefficient was 0.37. It can be concluded that the factors had no significant influence on service characteristics. There was no correlation and no positive influence on the factor efficiency of cross-border transport management system using RFID sensor technology in Cross-border Transport Management System, Nong Khai Border Checkpoint and no clarity in the same direction; therefore, it cannot affect the efficiency of cross-border transport management system using RFID sensor technology in Cross-border Transport Management System, Nong Khai Border Checkpoint.

2) The results of analyzing and testing the relationship between Service Performance and efficiency of cross-border transport management system using RFID sensor technology in Cross-border Transport Management System, Nong Khai Border Checkpoint, the correlation coefficient was 0.79. It can be concluded that the Service Performance factor has a positive direct effect on the efficiency of cross-border transport management system using RFID sensor technology in Cross-border Transport Management System, Nong Khai Border Checkpoint, which has a statistically significant influence at the level. 0.01 explains that transport or logistics companies that provide good customer service, have sufficient service, provide equitable service and provide speed service will result in the Efficiency of Cross-border Transport Management System Using RFID Sensor Technology in Cross-border Transport Management System, Nong Khai Border Checkpoint. This finding is inline with the study of Liu (2021) showed that recovery speed of supply chain disruption, response time of supply chain disruption, coordination ability among cross-border e-commerce partners, experience sharing among cross-border e-commerce partners, joint planning among cross-border e-commerce partners, establish a good enterprise reputation for fairness, risk management team among partners, and develop a collaborative culture among partners are the key influencing factors of CBSCR. On this basis, it is proposed that the adaptability of supply chain is a top priority, which can be started from strengthening risk management culture, cooperation among partners and construction of supply chain agility )Liu, 2021.

7 CONCLUSION

This research provides the knowledge and practice for Cross-border Transport Management System, Nong Khai Border Checkpoint locating at Thailand and Laos borders to improve its facility, infrastructure as well as its service component to meet the requirement of logistics companies that use the service. Since the number of vehicles to cross the border are increasing consistently due to the growth of border business, it is essential that the cross-border transport management system must work in line with this growth.

In order to have satisfied or effective service level, cross-border transport management system using RFID sensor technology in Cross-border Transport Management System must have a one-stop service to fulfil all the requirement to cross the border of all vehicles every day, the service must be done in a speedy manner. For the service itself, it has to be reliable and service with equitability and adequate.
REFERENCES


