



Forecasting Success Factors for Developing Quality Standard of Trucking Services in the Eastern Border Areas

Yanin Patsopa^{1*}, Pisit Bungbua² and Benyada Krajangjaeng³

^{1*,2,3}Faculty of Science and Social Sciences, Burapha University Sakaeo Campus

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Abstract

This research aimed to 1) study the success factors of enterprise prototype of service quality standard for truck operation in Border of Eastern Area Border of Eastern Area. 2) study the essential level factors of truck service quality standard. And 3) Forecasting success factors to increase service quality standard for truck operation. The results revealed that 1) the success factors of enterprise prototype truck operation into 3 factors were business environment, organizational awareness and entrepreneurial characteristics. 2) This research was survey by questionnaire. The respondents' opinion of business environment was a high level; followed by organizational awareness and entrepreneurial characteristics. 3) Forecasting success factors; the components as ability to predict variables were to 64% consisting business environment (coefficient = 0.52) and organizational awareness (coefficient = 0.33).

Keywords: 1) Forecasting 2) Factors for Success 3) Service Quality Standard for Truck Operation

^{1*} Lecturer, Department of Logistics and Cross-Border Trade Management; E-mail: yaninp@buu.ac.th

² Lecturer, Department of Logistics and Cross-Border Trade Management; E-mail: pisitb@buu.ac.th

³ Lecturer, Department of Logistics and Cross-Border Trade Management; E-mail: benyada@buu.ac.th



Introduction

The goal of Thailand is to be a developed country with stability, prosperity, and sustainability in all dimensions. In the economic aspect, it is important to develop competitiveness at the global level by using past knowledge, infrastructure development, and logistics system for facilitation. Additionally, entrepreneur and business model development in responding to future market demand are also important. In 2020, Thailand was ranked 29th at the global level in terms of competitive ability, which was lower from 2019. When compared with other ASEAN countries that are members of the Institute of Management Development (IMD), Thailand was ranked 3rd (Singapore and Malaysia were ranked 1st and 2nd, respectively) (IMD World Competitiveness Center, 2020, pp.1-112). In the competitive ability aspect, Thailand's goods distribution facilities had improved.

However, after the impact of COVID-19, many countries that are Thailand's key trading partners – China, the United State of

America, and the European Union had to shut down their countries. The pandemic also slowed down Thailand's export, except for neighboring countries. The neighboring countries that have the highest cross-border trade are the Lao People's Democratic Republic, Myanmar, and Cambodia. The border trade market with the least contraction in trading value is Cambodia (Department of Foreign Trade, 2021, pp.1-3). China and Thailand are top trading partners of Cambodia (The Observatory of Economic Complexity, 2019). It was expected that Cambodia would have the value of foreign

imports increase by 5.9% in 2021, which could rank up to 5th among Southeast Asian countries (Asian Development Bank, 2020). The majority of goods between Thailand and Cambodia is transported by road through the Aranyaprathet Customs House, Khlong Yai Customs House, and Chanthaburi Customs House. In these provinces, there are more than 900 trucking service providers, but most of them are trucking transport entrepreneurs registered in small and medium size businesses. There are many important problems for small and medium-sized businesses, e.g., financial liquidity, cost management, technology, personnel inadequacy, network, and aggregation. The Department of Land Transport has collaborated with relevant private sector agencies to develop a quality standard system for trucking services. This collaboration aims to support the development of logistics systems, empower entrepreneurs, and build the competitiveness of Thailand. At the present, there are 192 entrepreneurs which have certified the quality of trucking services (Q Mark) classified as 173 non-fixed truck registered entrepreneurs, 16 personal truck entrepreneurs, and 3 frozen cargo truck entrepreneurs (Truck Data Service Center, 2020). Those that were qualified will receive special interest rates on car insurance, establishing an image of confidence for the organization, supporting various government projects, and providing assistance and advice on corporate management. To promote the ability of small and medium size truck transportation business entrepreneurs in the eastern border provinces and to increase the level of Thailand's trade competitiveness in the world

trade arena, we, therefore, are interested in studying in these topics with objectives as follows:

1) to study the success factors of the model organization that passed the quality standard of trucking services in the eastern border area.

2) to study the level of importance of the quality standard development factors of trucking service in the eastern border area.

3) to forecast the success factors for developing a quality standard of unqualified organizations' trucking services in the eastern border area.

Literature Review

Logistic Provider

Farahani and Rezapour (2011, pp.13-24) said that logistic providers had a duty to prepare logistic services for employers according to their objectives and types of products. The modes of shipping were a combination of 6 types of logistic transport including 1) road transport, 2) rail transport, 3) air freight or air transport, 4) water transport, 5) pipeline transport, and 6) multi-modal transport. Due to its advantages in terms of speed, flexibility, and door-to-door service, road transport was used as a connecting pathway. Thailand, therefore, had many road transport entrepreneurs registered with small and medium size businesses. It was classified as 311,209 personal trucks (90%) and 34,744 non-fixed trucks (10%) (Department of Land Transport, 2021).

The Quality Standard of Trucking Service

Department of Land Transport (2019, pp.3-9) described concepts of quality stan-

dard of trucking service that the organization should develop their transportation for the satisfaction of service user, this would help the organization to receive more confidence from service users and turn their transportation being more secure. Trucking transport entrepreneurs certified in the quality of trucking services will receive a Q mark placed on their trucks and receive the Department of Land Transport's benefits, e.g., considerations for renting a freight station or truck stop service. In the aspect of asking for approval to perform international goods transportation, trucking transport entrepreneurs certified the quality of trucking services will receive information and meeting invitations from the Department of Land Transport.

The quality standard of trucking service includes 6 terms covering the trucking service performance, e.g., 1) organization term, 2) transportation term, 3) personnel term, 4) vehicle term, and 5) client term, a totally 39 terms, it is classified as 27 regulations that must be complied and 12 recommendations to improve the efficiency and quality of performance.

Quality of Service

There are many researchers who study the theory related to the quality of service, e.g., Yarimoglu (2014, pp.79-93) and Berry, Parasuraman, and Zeithaml (1994, pp.32-45) said that quality of service meant assessment or comment about overall service, which appeared from comparing between service recipient expectation and quality of actual service. For the quality of service measurement, the customer would measure tangible service,



reliability, assurance, responsiveness, and empathy.

Related Literature

This research was studied and reviewed from international research. This research told about the quality development of trucking services, the finding revealed that the main problems of quality development and increasing competitiveness of transportation and logistic entrepreneur were operational problems. Pradita and Ongkunaruk (2019, pp. 1-4) studied the problem of competitive development of temperature control products logistic service among third-person in Indonesia, it was found that the operation didn't belong with strategy, service delay, and recording and tracking temperature data was problematic. Sukonthasing (2017, p.97) studied the problem of increasing competitiveness with the quality standard of trucking service (Q mark standard) in road transport businesses in Phetchabun province for supporting free trade, it was found that the cause of the problem came from operators and operations that didn't belong with the standard. The study of Sukonthasing (2017, p.97) was consistent with the study of Malichareernwong (2018, p.67), which revealed that the public and private sectors should integrate cooperation in promoting the building of competitiveness for small and medium-sized truck transport operators by starting from planning the integration of work, legislating that favors the road transport business and building a network of alliances or business cooperation between the public and private sectors, financial institution, educational institution, and research and development Institute. Ad-

ditionally, Sriwongjanya and Charoenwiryaku (2020, pp.39-56) studied key factors of increasing Thailand's transportation competitiveness, which included 1) management factor 2) technology factor 3) personnel factor and 4) entrepreneur factor. Kennedy (2018, pp.54-71) selected the SERVQUAL model in the study of transport staff service and suggestion for providing a training program to provide high standards of safe operation and customer service for transport staff, to increase marketing value, and develop organizational competitiveness.

Methods

This research was mixed-method research which included a qualitative research method with an in-depth interview technique and a quantitative research method. There were operating procedures according to the methodology in order, which were as follows.

Population and Sample Group

1) The population that was used in qualitative research were supervisors of small and medium size trucking transportation businesses which was certified with Q mark in the eastern border area, e.g., Sa Kaeo province, Chanthaburi province, and Trat province. The sample group for qualitative research was 12 supervisors with 3 years of experience in small and medium size trucking transportation businesses which were certified with Q marks in the eastern border area using the purposive sampling method.

2) The population that was used in quantitative research was 360 personnel of small and medium size trucking transportation businesses which was not certified with Q mark

in the eastern border area, e.g., Sa Kaeo province, Chanthaburi province, and Trat province. The sample group quantitative research was selected by the nonprobability sampling method. From sample group selecting using purpose sampling method among personnel of small and medium size trucking transportation businesses which were not certified with Q mark in eastern border areas, e.g., Sa Kaeo province, Chanthaburi province, and Trat province (Wongwanich and Wiratchai, 2011, pp.99-122), it used a method for determining the sample size using a percentage of the population studied according to the Tirakanant criteria (2013, pp.1-302), it was found that the population was less than 500 people, and the sample size was 50%. Therefore, there were 180 samples in this research. We gave 200 questionnaires to them. We received 100% responses (200 questionnaires), and we meticulously selected 196 questionnaires that had the most complete response. We used data from these questionnaires to analyze for receive research results that had the most accuracy.

Qualitative Research Methods

1) Studying the research papers related to the theory and concepts of quality standards of trucking service quality standards in order to construct an in-depth interview.

2) Preparing interview questions by separating them into 3 parts consisting of personal data, opinion on trucking service quality standards, and quality standard development of trucking service in the eastern border area.

3) Presenting to 3 experts for validating research instrument validity with content validity method used Index of Item Objective Congruence (IOC), the result was 0.78.

4) Interviewing 12 key informants of small and medium size trucking transportation businesses which were certified with Q mark in the eastern border area, e.g., Sa Kaeo province, Chanthaburi province, and Trat province.

5) Verifying completeness of the information obtained from the in-depth interviews with methodological triangulation of Denize (Denizen, 1970, p.142 as cited in Kitphati, et al., 2021, p.4096), which were as follows.

Data Triangulation Verification for verifying received data emphasizes the data received from various sources.

Investigator Triangulation Verification for proving in-depth interview data using more an expert in interviewing and observation.

Methodological Triangulation Verification from observation while interviewing.

6) Analyzing in-depth interview data using methods for extracting content from data with content analysis.

Quantitative Research Methods

1) Bringing qualitative research results from data extraction of in-depth interviews among key informants of the model company which certified the trucking service quality standard (Q mark), to design questionnaires for this study. We separated questionnaires into 3 parts consisting of respondents' personal data, opinions on success factors for developing quality standards of trucking service, and suggestions to collect qualitative data among the sample group.

2) Validating and assessing consistency using the Index of Item Objective Congruence (IOC) by 3 experts, the consistency result was 0.81.



3) Verifying reliability by bringing the questionnaire to try out from the sample group, i.e., 30 workers who worked in small and medium size of trucking transportation businesses in the eastern border area, Cronbach's Alpha Coefficients was 0.85.

4) Submitting the questionnaire to the sample group.

5) Verifying content validity of responded questionnaires from a sample group, considering select questionnaires that had the most complete response to analyze with Mean, Standard Deviation (S.D.), and Multiple Regression Analysis.

Results

1) From content validation of in-depth interviews among key informants, it was found that certifying the quality standard of trucking service (Q mark) was building strengths for entrepreneurs, in addition to building reliability for clients and developing competitiveness in trucking service in Thailand. The organization that certified quality standard of trucking service emphasized 3 factors, there were as follows:

1. Business Environment Factor

The organization that certified quality standards of trucking service (Q mark) in the eastern border area (Sa Kaeo province, Chanthaburi province, and Trat province) provided service either inside the country or outside the country would have Q Mark placing the side of their trucks. It showed service standard that was officially accepted in the member countries of the ASEAN Economic Community. When considering the external business environment, the technology factor was the key

factor to stimulate which was been mentioned a lot among informants. The most of key informants had opinions that technology was an important tool for transport operations. Not only technology would be used to facilitate communication between organizations, but it also was a key factor to develop trucking service efficiency, e.g., vehicle-to-infrastructure (V2I) communication of GPS systems for automatically detecting truck and road position. It would help drivers to know real-time information, in addition to inspecting real-time traffic and accidents, and it could suggest the nearest parking place for the tired driver. It was an advantage of making safety for drivers and transportation. Additionally, the key informants also mentioned external factors about regulations of the availability of transport vehicles, measures of working hours, and economic factors, especially the economic growth of neighboring countries which affected trucking service competitiveness. The entrepreneurs had to build reliability and develop the competitiveness of their businesses, this made the quality standard of trucking service (Q mark) become an endorsement of the member countries of the ASEAN Economic Community. However, social and cultural factor was only mentioned among some key informants.

Regarding the internal business environment factor, the key informants emphasized only the operations. The organization that certified quality standards of trucking service had to have systematic implementations. They had to determine clear duty for their personnel, have a plan (Plan), operational guidelines (Do), informational collection after analysis (Check), and editing for continued



trucking service improvement (Action). Factors which caused efficient operations, key informants told that it should be having suitable working environment, e.g., medical welfare, accommodation, facilities, tools and equipment needed for truck maintenance, etc. Additionally, working facilitated organizational structure and having competent personnel with good attitude could help strategic determination of organizations for moving toward the goal.

2. Organizational Personnel Awareness Factor

The organization that certified the quality standard of trucking service (Q mark) emphasized organizational personnel awareness in these aspects, which were as follows: perception, feeling, and behavior, by promoting organizational awareness in trucking service. Organizational awareness promotion in trucking service, it should start from building personnel understanding to have knowledge about safe operations, having operational guidelines with the person-in-charge, and having a working system building client confidence, e.g., transportation route planning, perception of risk points, determining safe parking spots, the measure of speed control and emergency management for leading organizational personnel received expertise in freight forwarding services. Organizational awareness promotion had to be continuously analyzed to find continued improvement guidelines and the organization should have activities to build workers' morale by praising and creating pride for employees, e.g., giving prize money, compliment, or certificate as a gift. Working

belongs appropriate guidelines affected personnel having a commitment to work, which led to having shared values in the organization, a good working attitude, and awareness of the operation.

3. Entrepreneur Characteristic Factor

In addition to the cooperation of organizational personnel making quality trucking service according to standard, informants mentioned the competence of executives in moving organizations to receive a certification of quality standard of trucking service (Q mark). Entrepreneurs and executives had to be visionary and capable of management and strategy, and they should have the competence to develop the personnel and work with efficiency.

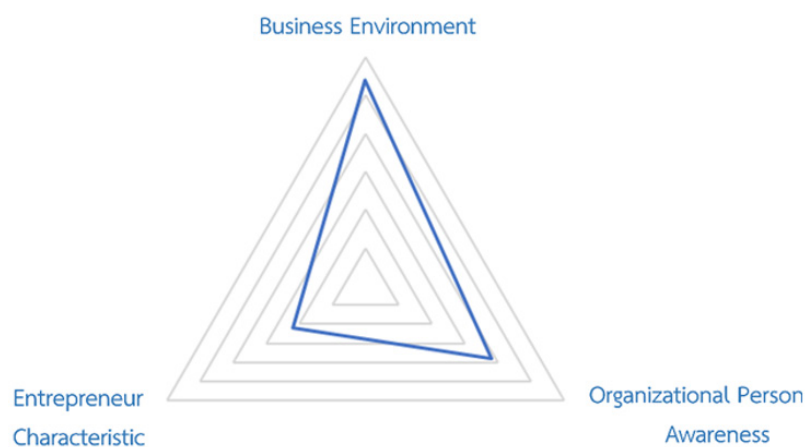


Picture No. 1 Success Factor of Model Organization That Certified Trucking Service Quality Standard

2) Priority Analysis Result of Quality Standard Development Factors of Trucking Service

In respondents' opinion about small and medium size of trucking service businesses in eastern border areas (Sa Kaeo province, Chanthaburi province, and Trat province), which did not certify the quality standard of trucking service, it was found that the business

environment factor was the most important to quality standard development of trucking service, mean (\bar{x}) was 4.22, standard deviation (SD) was 0.60, followed by organizational personnel awareness factor, mean (\bar{x}) was 4.14, standard deviation (SD) was 0.57, and entrepreneur characteristic factor, mean (\bar{x}) as 4.06, standard deviation (SD) was 0.51, respectively. The data was shown in Picture No. 2.



Picture No. 2 Priority of Quality Standard Development Factors of Trucking Service in Eastern Border Area

3) Forecasting Quality Standard Development Factors of Trucking Service

Bringing 3 quality standard development factors of trucking service in the eastern border area (Sa Kaeo province, Chanthaburi province, and Trat province), which were as follows: business environment factor, organizational personnel awareness, and entrepreneur characteristic factor. Regarding regression coefficient analysis which affected forecasting competence (Sa Kaeo province, Chanthaburi province, and Trat province) in businesses that were not certified quality standard of trucking service, there were 2 factors as follows: business environment factor and organizational

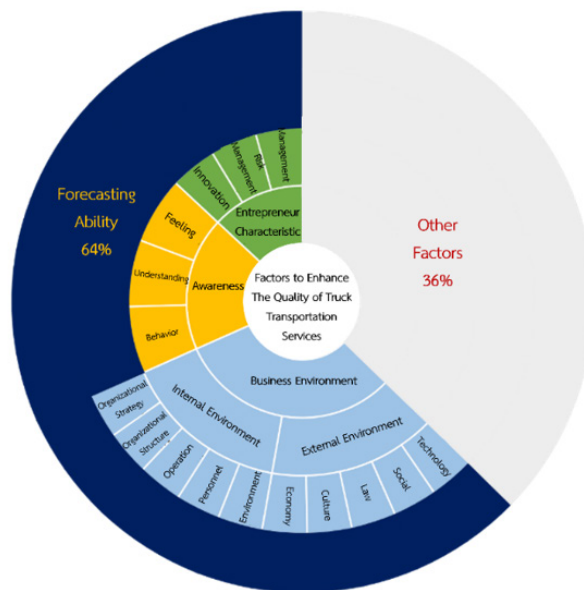
personnel awareness factor. The regression coefficient was 64% (shown as Picture No. 3), factors which resulted positively in quality standard development in the eastern border area with statistically significant as 0.05, and the constant value was 0.80. When considering each aspect, the coefficient of the business environment factor was 0.52, and the coefficient of the organizational personnel factor was 0.33 (shown in Table No. 2). Equation of forecasting factors affected to quality standard development of trucking service in the eastern border area, which was as follows.

$$y = 0.80 + 0.52X_1 + 0.33X_2$$

Table No. 1 Regression Coefficient of Quality Standard Development Factors of Trucking Service

Quality Standard Development Factors of Trucking Service	B	Beta	t	sig
Constant Value	0.80		3.87*	0.00
Business Environment	0.52	0.56	10.49*	0.00
Organizational Personnel Awareness	0.33	0.38	5.62*	0.00

p < 0.05, R2 = 0.64



Picture No. 3 Forecasting Capability Model of Quality Standard Development Composition of Trucking Service in Eastern Border Area



Conclusion and Discussion

The finding revealed that the success factors of the model organization which was certified quality standard of trucking service consisted of 1) business environment factor, 2) organizational personnel awareness factor and 3) entrepreneur characteristic factor. This finding was consistent with the research of Sriwongjanya and Charoenwiriya (2020, pp.39-56), that studied the increasing competitiveness of private transport business inside the country, their research finding revealed that factors related to increasing competitiveness of private transport business inside the country were as follows: 1) management factor, 2) technology factor, 3) personnel factor, and 4) entrepreneur factor. This research was consistent with the research of Ariyaprasert, Pinthapataya, and Boonyasopon (2020, pp.314-323), that studied organizational management model development for Thai industrial business in the era of economic upheaval, their research finding revealed that the result of extracting data which was the composition of organizational management for Thai industrial business in the era of economic upheaval was as follows: 1) organizational characteristic factor, 2) process factor and 3) organizational leadership factor. Additionally, this research was also consistent with the theory of Morris, et al (1977, pp.385-401 as cited in Ahmedova, 2015, p.1105), that said competitiveness level was organizational success level, and organizational development was an opportunity for receiving more income and building long-term stability for the organization. The entrepreneurs had to have good management skills,

good knowledge, understanding, and expertise on the job or in business. Organizational personnel had to have technological knowledge, systematic management competence, and decisional skill leading to be ready to work in a corporate business environment. If entrepreneurs and organizational personnel had such capabilities, the organization would be able to create opportunities for cost competitiveness, reducing loss, increasing freight safety, including creating standardly quality service.

The study of priority of quality standard development factors of trucking service in the eastern border area, organizations in trucking service businesses that were not certified quality standards in the eastern border area (Sa Kaeo province, Chanthaburi province, and Trat province) emphasized business environment factor as the most priority, followed by organizational personnel awareness factor and entrepreneur characteristic factor, respectively. This finding was consistent with the study of Moonsri (2020, pp.63-79) which studied overall management affected businesses performance in Luangprabang-Indochina-Mawlamyine Economic Corridor (LIMEC), which revealed that respondents spent their attention to the internal business environment in each aspect, which was as follows: organizational structure aspect, management strategy aspect, personnel aspect and shared values of the organization. Nupra-in and Junsang (2020, pp.118-129) studied bringing logistics management concepts applied to the Thai industry in the 4.0 era, it was found that applying digital technology to logistics businesses could increase efficiency in customer service and develop personnel

development in the organization, that was consistent with the theory presented by Cherunilam (2016, pp.3-32), that said business decisions and strategies depended on the business environment that consisted of external factors, e.g., economic conditions, technology, internal organizational resources, cooperation among organizational personnel, etc. However, this research finding wasn't consistent with the study of Silpcharu and Noongam (2020, pp.1-10), their findings revealed that large corporations placed the highest importance on organizational leadership characteristics. Due to the study of priority of quality standard development factors of trucking service in the eastern border area was the study in small and medium size of businesses, organizational development, therefore, focused on different factors, that was consistent with the theory of Robins and Coulter (2002, p.880 as cited in Theodore, 2009, p.46), which said that the size of the organization affected to organizational structure, large organizations prioritized centralization over smaller organizations.

The forecasting result of success factors for developing a quality standard of trucking service businesses that were not certified quality standard in the eastern border area revealed that success forecasts of business environment factor and organizational personnel awareness factor were 64%. The forecasting result was consistent with the study of Ceptureanu (2015, p.59), which said that the concept of developing the competitiveness of small and medium-size entrepreneurs had to be considered in many dimensions, and business environments factors affected the competitiveness

of small and medium-sized entrepreneurs. This research was consistent with the study of Liu and Lai (2016, pp.263-277), which studied providing serviceability to factors outside the business, it was found that external business factors affected to resource efficiency of 3rd party logistics providers in cost competitiveness. This research also was consistent with Nusem, Matthews, and Wrigley (2019, pp.35-49), who explained the integration of strategic design in new businesses with a focus on the development of awareness-raising factors as the first priority. Additionally, this research also was consistent with the theory of Ahmedova (2015, pp.1104-1112), which explained factors in the business environment that improved the promotion of competitiveness for small and medium size entrepreneurs, it was separated into 3 groups that followed:

- 1) national environmental factors, e.g., global economic conditions, national economic stability and growth, government policies, trade liberalization, international trade agreements, infrastructure suitable for doing business, etc,
- 2) industrial factors, e.g., price fluctuations, demand fluctuations, seasonal fluctuations, business competition, cooperation with partners, supplier quality, etc, and
- 3) organizational factors, e.g., cost, technology, quality of production and service processes, human resource management, access to funding, etc.

Research Suggestions

1. Transportation and logistics are types of businesses that reflect the growth of the Thai economy and the world economy,



especially road transport, due to it is transport form correlated various transportation. Leading the entrepreneurs of small and medium size of trucking service businesses to follow international service standards is important to the competitiveness development of Thai entrepreneurs. It helps to build a business environment facilitating foreign trade and investment. Additionally, it is also the opportunity for educational institutions to be participate in small and medium size trucking service businesses' entrepreneur development by bringing knowledge, technology, and innovation to educate them.

2. From unstable Thai economic and

world economic situation, e.g., technological change, trade war, political situation, unrest in different countries, epidemic, and rapid climate change, etc, it affects the sustainability of all businesses, including road transport business. Small and medium-sized business entrepreneurs have to adjust business strategies to meet the needs of current clients, e.g., transport services must be able to inspect immediately, speedily, and reliably. Therefore, entrepreneurs can use this experimental research result for standardly organizational safety performance, in addition to implementing the strategy for building reliability to clients and long-term business stability.

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