

The Development of Trucking Service Quality According to the Q Mark Standard: A Case Study of Haad Thip Public Company Limited

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ตามเกณฑ์ข้อกำหนด Q Mark

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Abstract

The objectives of this research were to study and evaluate the performance of Haad Thip Public Company Limited according to the Q Mark criteria, and to suggest guidelines for improving the quality of truck transportation services for Haad Thip Public Company Limited according to the Q Mark criteria as well as proceed with applying for standard certification. Using a standard semi-interview assessment tool through transportation, business development, distribution and maintenance departments. This tool is based on the Q Mark standard of the Department of Land Transport. It covers 5 aspects in terms of organization, transportation operations, employees, vehicles, and customers and external parties' aspects as well as focusing on department managers to be the most useful and relevant information. The results found that the overall compliance in all 5 aspects at 61.5 percent after the researcher proposed guidelines. Moreover, actions to correct Improve and develop work processes along with proceeding with the proposal and the results of the post-implementation conformity assessment were clearly consistent with the increased Q Mark requirements in all aspects with 97.4 percent. However, only the customer and external aspect having a level of compliance at 80 percent but the level of compliance with organizational requirements, transportation operations, employees, and vehicles were consistent at 100 percent. Such operations have resulted in Haad Thip Public Company Limited having a more efficient overall work process covering all aspects as well as being able to increase the efficiency of the organization's transportation. Moreover, these results can increase the competitiveness of the truck transport business group more widely and increase opportunities for the organization to move forward into the international transportation business in the future as well.

Keywords: Trucking Service Quality Standards, Q Mark, Service Quality, Haad Thip Public Company Limited.

บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อศึกษาและประเมินผลการดำเนินงานของ บริษัท หาดทิพย์ จำกัด (มหาชน) ตามเกณฑ์ข้อกำหนด Q Mark และเพื่อเสนอแนะแนวทางการพัฒนาคุณภาพบริการขนส่งด้วยรถบรรทุกแก่ บริษัท หาดทิพย์ จำกัด (มหาชน) ตามเกณฑ์ข้อกำหนด Q Mark และดำเนินการยื่นขอการรับรองมาตรฐาน โดยใช้เครื่องมือแบบประเมินตามมาตรฐาน กึ่งสัมภาษณ์ แผนกขนส่ง พัฒนารูทกิจ กระจายสินค้า และซ่อมบำรุง ตามเกณฑ์มาตรฐาน Q Mark ของกรมขนส่งทางบก ซึ่งครอบคลุมทั้ง 5 ด้านได้แก่ ด้านองค์กร ด้านปฏิบัติการขนส่ง ด้านพนักงาน ด้านยานพาหนะ และด้านลูกค้าและภายนอก โดยเน้นไปที่ผู้จัดการแผนกเพื่อข้อมูลที่เป็นประโยชน์และเกี่ยวข้องที่สุด ผลการวิจัยพบว่ามีความสอดคล้องทั้ง 5 ด้าน อยู่ที่ร้อยละ 61.5 นอกจากนี้ หลังจากที่ได้ผู้วิจัยได้เสนอแนวทางการดำเนินการเพื่อแก้ไข ปรับปรุงและพัฒนากระบวนการทำงาน พร้อมทั้งดำเนินการตามข้อเสนอเหล่านั้น ผลการประเมินความสอดคล้องหลังการดำเนินการมีความสอดคล้องกับข้อกำหนด มาตรฐาน Q Mark ที่เพิ่มขึ้นในทุกหัวข้ออย่างชัดเจน โดยภาพรวมทั้ง 5 ด้านอยู่ที่ร้อยละ 97.4 อย่างไรก็ตามมีเพียงด้านลูกค้า และภายนอกที่มีความสอดคล้องอยู่ที่ร้อยละ 80 ส่วนความสอดคล้องกับข้อกำหนดด้านองค์กร ด้านปฏิบัติการขนส่ง ด้านพนักงาน ด้านยานพาหนะ มีความสอดคล้องอยู่ที่ร้อยละ 100 การดำเนินการดังกล่าวส่งผลให้ บริษัท หาดทิพย์ จำกัด (มหาชน) มีกระบวนการในการทำงานโดยรวมที่มีประสิทธิภาพมากยิ่งขึ้นโดยครอบคลุมทุกด้าน ตลอดจนสามารถเพิ่มประสิทธิภาพการขนส่งขององค์กร รวมถึงเพิ่มขีดความสามารถในการแข่งขันของกลุ่มธุรกิจขนส่งด้วยรถบรรทุก ได้อย่างกว้างขวางมากขึ้น และเพิ่มโอกาสให้กับองค์กรในการก้าวไปสู่ธุรกิจขนส่งระหว่างประเทศในอนาคต

คำสำคัญ: มาตรฐานคุณภาพการบริการขนส่งด้วยรถบรรทุก, Q Mark, คุณภาพบริการ, บริษัท หาดทิพย์ จำกัด (มหาชน)

Introduction

In the current global context characterized by free trade and intensifying market competition, businesses are experiencing a heightened interconnection in the management of supply and demand. It is no longer feasible for companies to function in isolation within their specific industries and sectors. Collaboration has become crucial, involving a network of partners including suppliers, logistics services, manufacturers, distributors, and ultimately customers (Department of Industrial Promotion, 2018). This collaborative approach is encapsulated in the concept of the Supply Chain, a modern idea that positions logistics as a crucial mechanism in industrial management.

Logistics is significantly important in the economic system. It represents a major expense for businesses, impacting and being impacted by other activities within the economic system. Improving the efficiency of logistics processes directly enhances the overall economic condition. Consequently, logistics has become a vital activity in supporting sales, almost as if it were a product or service itself (Sumrith et al., 2020).

Transportation, in particular, is considered a key logistics activity (Key Logistics Activities), with its costs accounting for approximately 40% of all logistics expenses, according to the Strategic Planning for Logistics Development by the Office of Logistics Policy and Planning, 2021. As shown in Figure 1, road transportation plays a crucial role in economic development and is the most popular mode for domestic transportation, as evidenced in Figure 1. This preference stems from the advantages related to the size and type of vehicles available for service. Road transport providers can choose vehicles that are most suitable for the size and type of a wide variety of goods, more so than other forms of transportation (Boonlar & Nimitphuwadol, 2012).

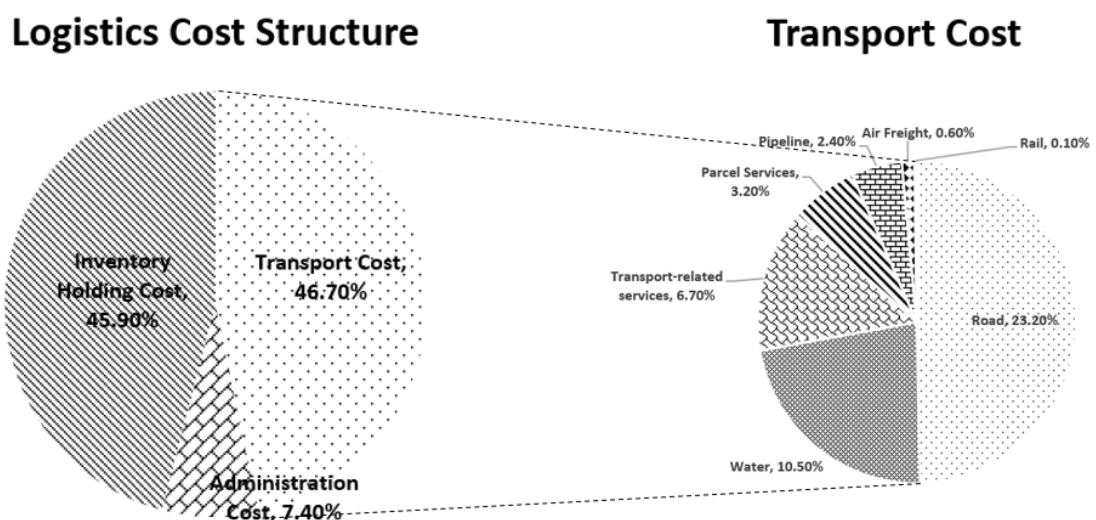


Figure 1: Logistics Cost Structure in 2021 (Office of Logistics Policy and Planning, 2021)

Throughout the past period, the Department of Land Transport has continuously supported and promoted transport operators, academically, through information, news, and advice from knowledgeable experts, to develop into strong transportation and logistics operators capable of efficiently supporting the trade and industrial sectors of the country. Furthermore, the Department of Land Transport has implemented projects to elevate the quality standards of trucking services, known as the Q Mark. The objective is to develop and promote transport operators to achieve standards that elevate the quality of service to be competitive in the free trade market's transportation sector. This involves utilizing the Q Mark service standards for trucking as a tool to develop the potential of transport operators, covering five areas: organizational, operational, employee, vehicle, and customer and external aspects.

While the adoption of quality standards such as the Q Mark standard by the Department of Land Transport aims to elevate the quality of trucking services, there exists a gap in understanding how effectively companies like Haad Thip Public Company Limited can implement and benefit from these standards. Despite the efforts to promote collaboration and enhance logistics efficiency, challenges persist in translating standards into tangible improvements in service quality and competitiveness. This research seeks to address this gap by investigating the implementation of the Q Mark standard within Haad Thip Public Company Limited and its impact on service quality and competitiveness. By identifying and elucidating the challenges and opportunities associated with adopting quality standards in the trucking industry, this study aims to provide valuable insights for enhancing logistics service quality and advancing the industry's development.

Given the context, the research on developing the quality of trucking services of Haad Thip Public Company Limited according to the Q Mark standard has been initiated. This standard serves as a guideline for enhancing service quality to be recognized and appreciated by customers, potentially increasing the efficiency of organizational transportation and the competitive capability of the trucking business group more broadly. This opportunity allows the organization to compete in the international transportation business in the future, thus enhancing the transportation sector and boosting the country's overall industry.

Research Objectives

1. To study and evaluate the performance of Haad Thip Public Company Limited in accordance with the Q Mark standard.
2. To propose strategies and develop the quality of trucking services for Haad Thip Public Company Limited according to the Q Mark standard, and to proceed with the application for standard certification.

Literature Review

Measuring Logistics Service Quality (LSQ) is crucial for organizations aiming to enhance customer satisfaction and gain a competitive edge in the logistics industry. Kilibarda et al. (2020) have summarized and categorized it as follows:

SERVQUAL: SERVQUAL, developed by Parasuraman et al. (1988), is a widely used method for assessing LSQ. It measures service quality based on five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. Customers' perceptions of service performance are compared against their expectations, allowing companies to identify gaps and prioritize improvement efforts.

SERVPERF: SERVPERF, proposed by Cronin and Taylor (1992), focuses solely on service performance without considering customer expectations. It measures LSQ based on the perceived performance of service attributes, providing a more direct assessment of service quality.

LSQ Scale: Mentzer et al. (1999) developed the LSQ scale, emphasizing processes to measure logistics service quality. This approach evaluates specific aspects of service delivery, such as timeliness, accuracy, and completeness, offering a detailed analysis of LSQ dimensions.

Kano Model: The Kano Model, introduced by Kano et al. (1984), classifies service attributes into three main types: basic, performance, and excitement. Basic attributes encompass fundamental features that customers expect and require in a service; their absence can lead to dissatisfaction and a loss of trust. Performance attributes add value to the service, enhancing customer satisfaction and enabling organizations to expand their customer base and competitive position. Excitement attributes exceed customers' expectations and create memorable experiences, fostering strong loyalty. By utilizing the Kano Model, organizations can gain insights into the impact of different service attributes on customer satisfaction and prioritize efforts to enhance service quality effectively in alignment with customer needs and expectations (Zhang et al., 2024).

Statistical Analysis: various statistical tools and approaches are employed in logistics to measure service quality. Studies have utilized regression analysis, Exploratory Factor Analysis (EFA), and Confirmatory Factor Analysis (CFA) to assess LSQ in different contexts, such as Singapore (Thai et al., 2014). Additionally, examples of ANOVA and linear regression applications for LSQ measurement exist; Surveys, including questionnaires, in-depth interviews, personal and telephone surveys, and cross-sectional surveys, are commonly utilized as statistical tools in LSQ measurement (Kilibarda et al., 2020).

Standards: Adherence to standards such as ISO and Quality Management Systems (QMS) provides organizations with a framework for evaluating and improving LSQ (Kilibarda et al., 2020). Compliance with recognized standards helps ensure consistency and reliability in service delivery.

IV-q-ROF-ARAS: The Interval-Valued-q-Rung Orthopair Fuzzy-Additive Ratio Assessment Model (IV-q-ROF-ARAS) is a sophisticated decision-making tool for handling uncertainty. It combines interval-valued representations, q-Rung Orthopair Fuzzy Sets (q-ROFS), and the Fuzzy-Additive Ratio Assessment (ARAS) method to rank alternatives effectively. By accommodating uncertainty and imprecision, this model enables informed decision-making in logistics service quality assessment, offering a structured approach for identifying areas of improvement within the logistics industry (Korucuk et al., 2024).

Q Mark: The Q Mark Standard, introduced by the Department of Land Transport (2023) in Thailand, outlines a comprehensive framework for assessing trucking service quality, encompassing organizational, operational, employee, vehicle, and customer aspects, totaling 39 criteria. These standards, comprising mandatory compliance requirements and recommended improvements, aim to enhance service reliability and uphold quality standards within the logistics sector. This article serves as a benchmark for evaluating Logistics Service Quality (LSQ). The requirements, applicable to operators of all sizes and types, cover five key aspects: Organization, Operation, Driver and Staff, Vehicle, and Customer and Communication. Of these, 26 are obligatory, while the remaining 13 are optional yet advised for operational enhancement. Organization requirements involve defining roles, establishing policies, utilizing technology, and implementing environmental protections. Operational requirements include documenting procedures, maintaining records, evaluating performance, and implementing emergency response plans. Driver-related requirements focus on recruitment, training, medical assessments, and safety policies. Vehicle requirements emphasize record-keeping, maintenance, safety equipment, and environmental considerations. Customer-related requirements stress record-keeping, satisfaction evaluation, feedback channels, customer information, and regular meetings for improved service delivery. This article serves as a metric for measuring Logistics Service Quality (LSQ).

Table 1 Comparison of Methods and Standards for Measuring Logistics Service Quality (LSQ)

Method/Standard	Description	Key Features	Application
SERVQUAL	Developed by Parasuraman et al. (1988), it assesses LSQ based on five dimensions: tangibles, reliability, responsiveness, assurance, and empathy.	- Compares customers' perceptions against their expectations - Identifies gaps in service quality - Helps prioritize improvement efforts	Widely used across various service industries to measure LSQ
SERVPERF	Proposed by Cronin and Taylor (1992), it focuses solely on service performance without considering customer expectations	- Measures LSQ based on perceived service performance - Provides a direct assessment of service quality	Suitable for evaluating service performance without the need for comparing with customer expectations
LSQ Scale	Developed by Mentzer et al. (1999), it emphasizes processes to measure LSQ, evaluating specific aspects such as timeliness, accuracy, and completeness.	- Offers a detailed analysis of LSQ dimensions - Focuses on specific aspects of service delivery	Useful for evaluating different facets of LSQ in detail
Kano Model	Introduced by Kano et al. (1984), it categorizes LSQ attributes into three types: basic, performance, and excitement.	- Assists in understanding the impact of service attributes on customer satisfaction - Helps prioritize efforts to enhance LSQ	Useful for understanding customer preferences and prioritizing improvement initiatives
Statistical Analysis	Utilizes various statistical tools such as regression analysis, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), ANOVA, linear regression, and surveys (questionnaires, in-depth interviews, personal and telephone surveys, cross-sectional surveys) to assess LSQ.	- Provides quantitative insights into LSQ - Enables data-driven decision-making	Widely applicable across different contexts for comprehensive LSQ assessment
Standards (e.g., ISO, QMS)	Adherence to recognized standards provides a framework for evaluating and improving LSQ.	- Ensures consistency and reliability in service delivery - Provides guidelines for quality management	Useful for organizations seeking to benchmark their LSQ against established standards
V-q-ROF-ARAS	Combines interval-valued representations, q-ROFS, and ARAS for decision-making.	Ranks alternatives effectively in uncertain contexts.	Ideal for assessing LSQ despite uncertainty.
Q Mark	Introduced by the Department of Land Transport (2023) in Thailand, it outlines a comprehensive framework for assessing trucking service quality, encompassing organizational, operational, employee, vehicle, and customer aspects.	- Comprises mandatory compliance requirements and recommended improvements - Aims to enhance service reliability and uphold quality standards	Specifically tailored for the transportation industry, providing a benchmark for evaluating LSQ in trucking services

The Q Mark Standard stands out as the most comprehensive and practical approach for assessing logistics service quality (LSQ). While other methods like SERVQUAL and SERVPERF focus on customer perceptions and specific service attributes, the Q Mark Standard provides a holistic framework covering organizational, operational, employee, vehicle, and customer aspects. With its 39 criteria, including mandatory compliance requirements and recommended enhancements, the Q Mark Standard ensures thorough evaluation and improvement of service reliability and quality standards within the logistics sector. Its applicability to operators of all sizes and types, along with its emphasis on key aspects such as organization, operation, driver and staff, vehicle, and customer communication, make it an indispensable tool for enhancing LSQ and gaining a competitive edge in the industry.

The research titled “Development of Trucking Service Quality of Haad Thip Public Company Limited According to Q Mark Standard” involved a comprehensive review of related studies, documents, and theories to establish a guideline for this investigation. The findings can be summarized as follows:

Logistics refers to all necessary operations for the delivery of goods or services, except for the production of goods or provision of services in the manufacturing industry. It encompasses the flow of materials between factories and within production lines in a factory, as well as the flow of information generated from transaction processes related to material flow. This includes analysis of past activities, forecasting, planning, scheduling of future activities, and the flow of capital resulting from the movement of goods and information (Khomnamun, 2007).

Logistics management emphasizes the connection between activities from the raw material procurement stage, through goods and services management, moving from the source of origin to the final consumer destination on time (Just In Time) and efficiently (Phupat, 2018). Therefore, it is evident that managing logistics efficiently and effectively requires linking activities at every step from origin to destination, where activities should minimize costs and maximize satisfaction, supporting the main activities to proceed as smoothly as possible. Logistics management can enhance the competitive capability of the entire supply chain by “responding to the end customer demand with what is needed, in the form it is needed, when it is needed, at a competitive cost.”

Transportation refers to the movement of people, animals, and goods from one location to another (Duangphastra, 2000). Transportation development aims to enhance the quality, standards, and efficiency of transportation. According to transportation principles, effective transportation must include speed, economy, safety, convenience, reliability, and punctuality (Aphiprachayasakul, 2003).

In Thailand, the primary transportation modes include land (truck/road and rail), water, air, and pipeline. Among these, land transportation, especially through trucks, plays a pivotal role by handling the highest volume of goods. This system supports communities by using various vehicles, such as 4-wheelers, 6-wheelers, 10-wheelers, and larger trucks, to transport nearly all types of goods. A significant advantage of truck transportation is its door-to-door service, providing greater convenience for both producers and consumers compared to other modes. Moreover, Thailand's extensive road network ensures comprehensive access across all 76 provinces, covering both urban and rural areas (Suntaraphakdee & Kongwattana, 2014).

The development of the trucking system is crucial for enhancing the country's logistics capabilities and competitive strength. Quality and standard-compliant trucking services that meet the demands of various industries support and drive efficient logistics and supply chain management processes for the trade and industrial sectors. This also prepares for future liberalization of trade services, creates a positive and confident service experience for users, ensures safety for road users, gains acceptance from both local and international service users, and enhances the capabilities of trucking service operators. This aligns with the government's policy on sustainable logistics system development in Thailand.

The specifications of these standards outline the framework for operations, detailing objectives, methods, and procedures that operators must tailor to fit their business operations and meet customer needs. This entails systematic operational procedures, independence of individual personnel, and ensuring quality service continuity despite staff changes. The trucking service quality standards encompass 5 areas: organizational, operational, employee, vehicle, and customer and external aspects, comprising 39 items. Of these, 27 items are mandatory compliance items, and 12 items are recommendations for improving efficiency and operational quality (Department of Land Transport, 2023).

In addition to the aforementioned concepts and theories, the researcher reviewed related studies on trucking service quality improvement. The findings indicate that Thailand's service sector, particularly in the truck and trailer operators' business, has experienced more significant growth than other logistics activities. In 2013, this sector contributed a moderate share to the country's Gross Domestic Product (GDP) and showed potential for future growth. This trend highlights the emphasis developed countries place on the service sector, especially in transportation and communication services, which support and facilitate the expansion of the retail and wholesale sectors.

In Thailand, studies on the readiness and adaptability of the Thai logistics service sector to trade and service liberalization have been conducted. Within the trucking sector, it has been found that most Thai operators are small and medium-sized enterprises (SMEs) lacking business standards. Predominantly characterized by individual operations, these SMEs often miss direct job opportunities from customers, leading to partnerships in transport ventures. The work is usually managed by truck owners focusing on existing customers, with little development towards attracting new ones. Additionally, there is a lack of modern technology and efficient, knowledgeable human resources in logistics, positioning Thai operators at a disadvantage in competition with large multinational companies (Theppitak, 2009).

In the logistics service sector, particularly in transportation, delayed product deliveries rank among the top issues necessitating immediate operational improvements to build confidence, increase customer satisfaction, and enhance competitiveness. Studies have shown that poor internal communication within organizations, often characterized by one-way communication, leads to misunderstandings. Departments and units analyze and interpret data independently, without sharing information in meetings for comprehensive awareness. Decision-making is isolated within departments without consulting related sectors or considering the impact on those decisions, leading to segmented problems at each operational stage. For instance, the sales department might accept orders without consulting planning and procurement, HR might hire employees without fitting the job requirements, and planning might not verify actual product quantities before scheduling loads. These issues directly impact the organization's ability to deliver products to customers promptly, necessitating urgent solutions (Ngamlert & Sirikul, 2015).

Furthermore, comparing the service quality of logistics providers with neighboring countries is essential to understand the expectations and perceptions of logistics service users. This can guide future development. Studies across four dimensions—physical appearance, reliability, responsiveness, and care—show that Cambodian logistics providers offer mid-level service quality, while Thai logistics providers offer high-quality services. A significant area for improvement for Thai logistics operators is the aspect of care (Donsomjit et al., 2013).

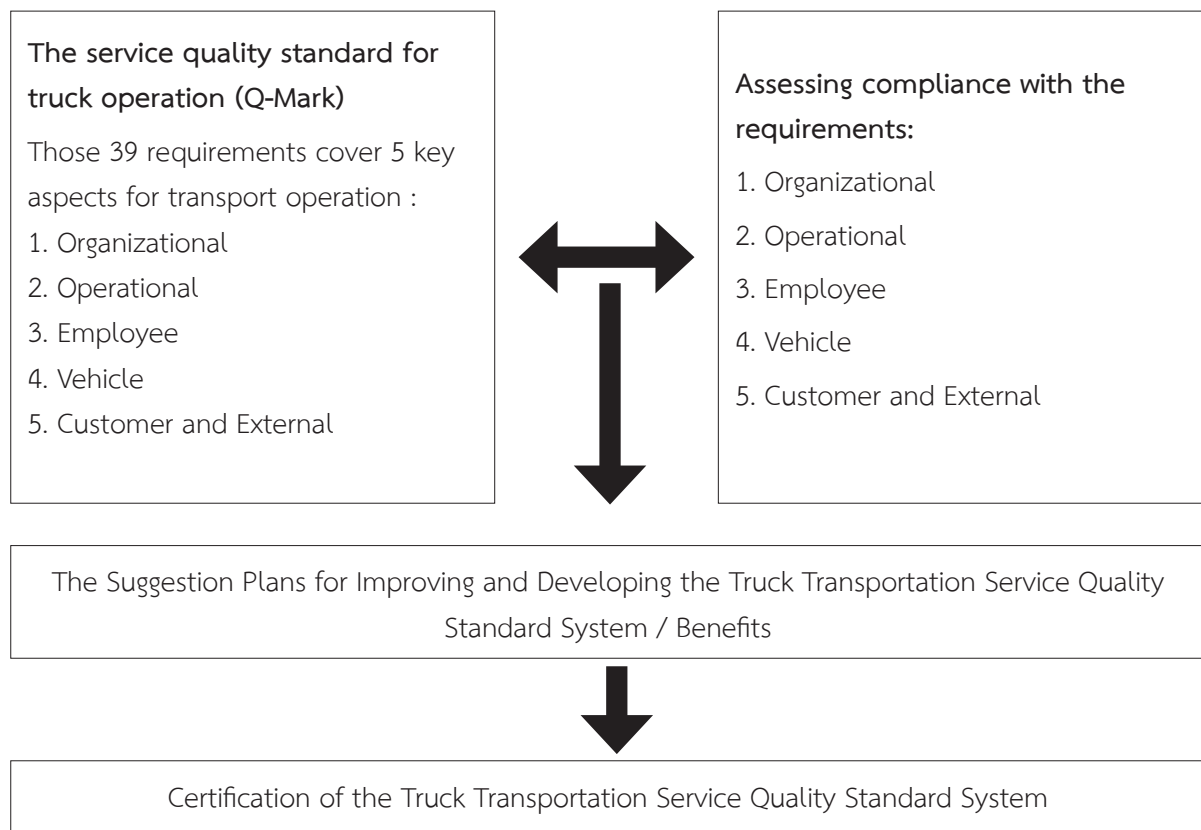


Figure 2: Conceptual Framework

Research Methodology

This study is a qualitative research endeavor that collected data using a semi-structured interview based on the Q Mark standard criteria set by the Department of Land Transportation to assess compliance. Additionally, to ensure the comprehensiveness of the data, focus group discussions were conducted to supplement and support the information through mutual contribution. Officials from the Department of Land Transportation's Freight Transport Office, along with relevant individuals, provided guidance, suggested evaluation methods, exchanged information, and debated to collaboratively develop a model for improving the service quality standard for truck operation (Q-Mark) with the researcher.

The research methodology is presented in sequential steps, including sources and sample data, research tools, and the procedure of conducting the research, detailed as follows:

Sources and Sample Data

This qualitative research focuses on truck operation service quality standards outlined by the Q-Mark from the Department of Land Transportation, supplemented by insights from relevant associations and centers. Utilizing “intensity sampling”, the researcher efficiently identifies data aligned with research objectives. Targeting (1) Transport, (2) Business Development, (3) Distribution, and (4) Maintenance departments, emphasis is placed on department managers' insights for data accuracy. A comprehensive evaluation adhering to Q-Mark standards involved discussions. A comprehensive evaluation adhering to Q-Mark standards involved discussions with three parties: the research team, officials from the Department of Land Transport, and senior executives at Hatthip Limited (Public)., ensuring methodological alignment and reliable findings.

Research Tools

For the study titled “The Development of Trucking Service Quality According to the Q Mark Standard: A Case Study of Haad Thip Public Company Limited,” the researcher employed qualitative research techniques to ensure comprehensive coverage and data accuracy in line with set objectives. The researcher personally conducted field visits and collected data using a semi-structured interview based on the Q Mark standard criteria of the Department of Land Transportation to assess compliance. Furthermore, to achieve data completeness, focus group discussions were organized to complement and support the data through mutual contribution, involving officials from the Department of Land Transportation's Freight Transport Office and related individuals who provided guidance, discussed compliance evaluation methods, exchanged information, and collaborated with the researcher to debate and discover a model for developing the trucking service quality standard system (Q Mark).

Table 2 The details of service quality standard for truck operation (Q-Mark)

Aspect	Requirement	Evidence	Example
Organizational	<ul style="list-style-type: none"> - Define roles and responsibilities within the organizational structure - Establish clear policy statement for efficient transport operation - Utilize information technology to improve efficiency - Implement procedures for environmental protection regarding solid waste - Develop and implement carrier's liability policy and procedure for claims - Consider organizational improvement or business plan - Employ advanced efficiency improvement techniques such as TQM - Consider accreditation by recognized standards - Engage with professional societies collaborating with Department of Transport - Explore additional logistic services - Ensure strategically located facilities 	<ul style="list-style-type: none"> - Org chart, Job Description - Operation policies - IT tools - Waste management records - Liability policy - Business process diagrams - Efficiency reports - ISO certificates - Membership certificates - Service details - Strategic plans 	<ul style="list-style-type: none"> - Roles and responsibilities clarified - Policies for efficient operation established - Technology used for efficiency enhancement - Procedures for waste management implemented - Policy and procedure for damage claims - Improvement plans considered - Techniques like TQM used for improvement - Accreditation by ISO standards considered - Collaboration with professional societies - Additional services explored - Facilities strategically located
Operational	<ul style="list-style-type: none"> - Document transport operation procedures for each customer - Have written work instructions for transport operation - Maintain records indicating operational efficiency - Evaluate operation based on key performance indicators (KPIs) - Develop and maintain speed management policy against speeding - Implement emergency response plan and conduct regular drills - Implement record-keeping system for incidents and accidents - Designate truck rest areas for travel safety 	<ul style="list-style-type: none"> - Operation manuals - Work instructions - Trip reports - KPI reports - Speed management policies - Emergency plans - Incident reports - Rest area plans 	<ul style="list-style-type: none"> - Procedures for each customer documented - Work instructions established - Records of operational efficiency maintained - Operation evaluated using KPIs - Policies for managing speeding implemented - Emergency response plan in place - Records of incidents and accidents kept - Rest areas designated for safety
Employee	<ul style="list-style-type: none"> - Document recruitment process for drivers and staff - Establish staff regulations & rules for drivers and staff - Implement annual training program covering safety and inspection - Support drivers' career paths and encourage pride - Keep current records of driver profiles 	<ul style="list-style-type: none"> - Recruitment procedures - Staff regulations - Training programs - Recognition programs - Driver profiles 	<ul style="list-style-type: none"> - Recruitment process documented - Regulations and rules for staff established - Annual training program implemented - Activities supporting driver pride planned - Current records of driver profiles maintained

Table 2 The details of service quality standard for truck operation (Q-Mark)

Aspect	Requirement	Evidence	Example
	<ul style="list-style-type: none"> - Conduct annual medical assessments for drivers - Monitor drivers' working hours for adequate rest - Implement proper alcohol and drug testing policies - Implement strict idling policy 	<ul style="list-style-type: none"> - Medical assessment schedules - Driver assignment plans - Testing schedules - Idling policies 	<ul style="list-style-type: none"> - Annual medical assessments conducted - Working hours monitored for rest - Policies and schedules for testing in place - Policy to minimize vehicle idling enforced
Vehicles	<ul style="list-style-type: none"> - Maintain records of fuel consumption or expenses for each vehicle - Have procedures for daily vehicle checks and maintenance - Keep records of vehicle repairs - Consider optional safety equipment - Consider environmentally friendly fleet improvements 	<ul style="list-style-type: none"> - Fuel consumption reports - Vehicle checklists - Repair records - Fleet safety equipment - Hybrid vehicles, EV trucks 	<ul style="list-style-type: none"> - Records of fuel consumption kept - Procedures for daily checks established - Records of vehicle repairs maintained - Optional safety equipment considered - Environmentally friendly fleet considered
Customer and External	<ul style="list-style-type: none"> - Keep records of customer contact and service usage - Implement customer satisfaction evaluation system - Establish communication channels for customer feedback - Obtain information about final customer to ensure ultimate satisfaction - Conduct regular meetings with customers for understanding their needs 	<ul style="list-style-type: none"> - Customer contact records - Satisfaction surveys - Feedback channels - Customer meetings - Customer meetings 	<ul style="list-style-type: none"> - Records of customer contact and service usage - System for evaluating customer satisfaction - Channels for customer feedback established - Meetings held to ensure customer satisfaction - Regular meetings held to understand needs

Source: Department of Land Transport (2023)

Researchers have defined a comprehensive research methodology encompassing a total of 7 steps, outlined as follows:

Step 1: Defining the Scope of the Study

The researcher selected Haad Thip Public Company Limited as the case study company to examine the operational processes of various departments related to the current trucking service quality standards (Q Mark) and the governmental agencies involved in these standards.

Step 2: Fieldwork Execution

After defining the scope, which includes Haad Thip Public Company Limited, the researcher sought permission to interview and evaluate by submitting a request letter from Walailak University to the executive management of the case study organization. Coordination with relevant departments was conducted, including Transportation, Business Development, Distribution, and Maintenance, to support qualitative data collection, clarify the study's objectives, and request cooperation for interviews and assessments.

Step 3: Data Collection

Data was collected from the samples using a semi-structured interview based on the Q Mark standard criteria by the Department of Land Transportation to assess conformity. Focus group discussions were also conducted.

Step 4: Data Analysis

The researcher utilized Gap Analysis to evaluate the compliance and non-compliance with the trucking service quality standards (Q Mark), focusing on five key aspects: organizational, operational, employee, vehicle, and customer. The findings were comprehensively presented using a Radar Chart, offering a visual overview of performance across these categories.

Step 5: Proposing Developmental Guidelines for the Q Mark Standard System to the Case Study Company

Upon completing Step 4, the researcher identified non-conforming issues to the service quality standards to develop and presented suggestion plan to the executive management of the case study company for consideration and approval. A comparison of different benefits and rights if certified was prepared to aid the decision-making process for approval.

Step 6: Implementing the Suggestion Plan for Improvements and Developments for Compliance with the Q Mark Standard System

Following approval in Step 5, the researcher executed the proposed improvements and developments within a timeframe. A further Gap Analysis was conducted to compare before and after the suggestion plan for implementation.

Step 7: Applying for Q Mark Standard Certification

Once the improvement actions were fully executed according to the proposed suggestion plan, the researcher proceeded to apply for the Q Mark quality standard certification with the Department of Land Transportation's Freight Transport Office.

Results

The research findings on the development of service quality in trucking at Haad Thip Public Company Limited according to the Q Mark standards are summarized as follows:

1. The outcomes of the initial assessment and analysis before the improvement and development according to Q Mark standards.
2. The outcomes of the assessment and analysis after the improvement and development according to Q Mark standards.
3. The results of the application for certification of the improvement and developed service quality standards for trucking.

Table 3 Results of compliance evaluation before the improvement and development according to the Q Mark standards of Haad Thip Public Company Limited

Assessment Item	Full Score	Score (Before)	Percentage (Before)
1. Organizational	11	6	54.5
2. Operational	8	6	75.0
3. Employee	10	7	70.0
4. Vehicle	5	2	40.0
5. Customer and External	5	3	60.0
Total	39	24	61.5

Gap Analysis

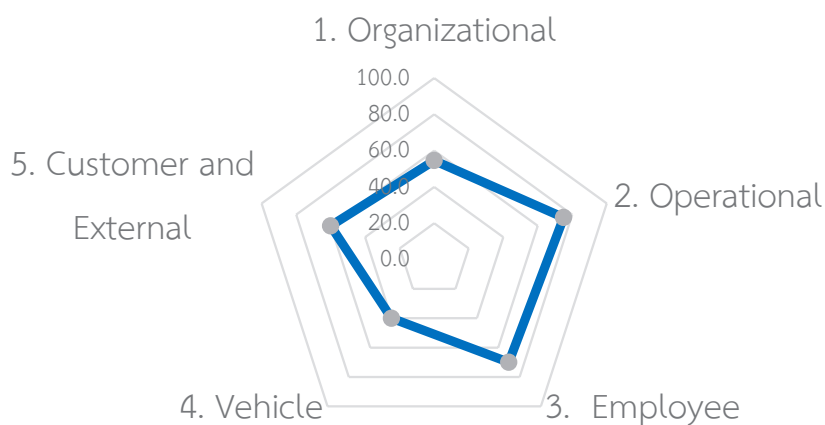


Figure 3 Pre-Development Gap Analysis of Trucking Service Quality

The research findings detail the improvement and development of service quality in trucking at Haad Thip Public Company Limited. From Table 3, the assessment of compliance before the improvement and development according to the Q Mark standards for Haad Thip Public Company Limited and Figure 3, the Gap Analysis, it was found that Haad Thip Public Company Limited was non-compliant in all aspects. Specifically, Category 4 (Vehicle) was only 40% compliant with the standards. Category 1 (Organizational) was 54.5% compliant, Category 5 (Customer and External) was 60% compliant, Category 3 (Employee) was 70% compliant, and Category 2 (Operational) was 75% compliant, with an overall compliance of 61.5% across all five aspects.

The study highlights necessary improvements in five key aspects:

Organizational: There is a crucial need for enhanced communication and clearer understanding of management structures and policies among employees.

Operational: Deficiencies in control over speed and driving behavior point to the need for better operational management and preparedness for emergencies during transport.

Employee: Issues such as inadequate communication with drivers and incomplete driver records underscore the need for better employee management practices.

Vehicle: This category showed the lowest compliance, indicating urgent needs for improvements in vehicle maintenance, safety equipment, and environmental considerations.

Customer and External: The need for better data collection and customer engagement practices to enhance understanding and fulfillment of customer needs was identified.

In response to these findings, a comprehensive evaluation aligned with the Q Mark standard was carried out, involving detailed reviews and discussions with officials from the Department of Land Transport and senior executives at Hatthip Limited (Public) Company. The improvement plans developed are concentrated on the same five critical areas:

Organizational: Ensuring a clear administrative structure with well-documented and complete job descriptions, clarifying roles and responsibilities to all employees, maintaining straightforward policies including those on drugs, alcohol, and safety, and strategically using information technology to boost efficiency and environmental sustainability.

Operational: Advocating for clear, detailed operational procedures with defined responsibilities at each step of the transport process, planning safe and efficient routes, and maintaining comprehensive records to demonstrate operational efficiency.

Employee: Setting high standards for the recruitment process, clear and comprehensive work regulations, and prioritizing regular training and skill development to enhance service quality and build a reliable workforce capable of meeting Q Mark standards.

Vehicle: Emphasizing the maintenance of detailed records of fuel usage and associated costs for improved analysis and cost-efficiency, and mandating vehicle readiness checks before trips to ensure reliability and safety.

Customer and External: Improving the collection and analysis of customer data and service histories to better understand and meet customer needs and establishing robust feedback channels from customers and external parties for continuous service improvement and adaptation.

Based on the detailed assessment before the improvement and development according to the Q Mark standards, the researcher studied the requirements and consulted with officials from the Department of Land Transport's Freight Transport Office, as well as high-level executives of Haad Thip Public Company Limited. It was found that the company had a policy and was committed to developing the quality of trucking services according to the Q Mark standards to achieve certification from the Department of Land Transport. The researcher proposed actions for improvement and development to comply with the standards, which were carried out according to the suggested approaches. Subsequently, data was collected once again.

Table 4 Results of the compliance assessment after the development according to the Q Mark standards for Haad Thip Public Company Limited

Assessment Item	Full Score	Score (Before)	Percentage (Before)	Score (After)	Percentage (After)
1. Organizational	11	6	54.5	11	100.0
2. Operational	8	6	75.0	8	100.0
3. Employee	10	7	70.0	10	100.0
4. Vehicle	5	2	40.0	5	100.0
5. Customer and External	5	3	60.0	4	80.0
Total	39	24	61.5	38	97.4

Gap Analysis

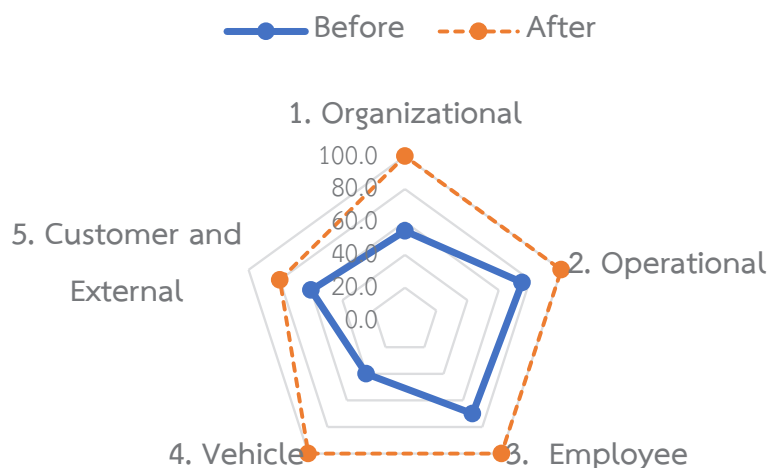


Figure 4 Post-Development Gap Analysis of Trucking Service Quality

Based on Table 4, the assessment of compliance after the improvement and development according to the Q Mark standards for Haad Thip Public Company Limited, and Figure 4, the post-development Gap Analysis of trucking service quality, it is evident that following the implementation of proposed actions, Haad Thip Public Company Limited significantly increased its compliance with the Q Mark standards across all categories. The overall compliance across the five aspects improved to 97.4%. The customer and external aspect reached 80% compliance due to limitations in detailed customer data collection, attributed to the legal restrictions of the Personal Data Protection Act (PDPA), preventing full compliance with this requirement. However, compliance in the organizational, operational, employee, and vehicle aspects reached 100%.

After completing the research steps, the researcher coordinated with the Department of Land Transport to express the intention to undergo an evaluation and was assigned the Thai Traffic Science and Transportation Association as the evaluator. The assessment fee was 16,500 THB, and the evaluation was successfully conducted on February 19, 2024. Haad Thip Public Company Limited met all the main requirements and was currently in the process with the Department of Land Transport for certification registration.

Discussion

The study aimed at developing the trucking service quality of Haad Thip Public Company Limited according to the Q Mark standards discusses findings based on the research objectives as follows:

Objective 1: To study and evaluate the operation of Haad Thip Public Company Limited according to the Q Mark standard criteria. The study and evaluation of the operations across all five aspects revealed non-compliance with the standards in all areas. In the organizational aspect, it was found that the case study company did not communicate the management structure, responsibilities of all positions, and various policies thoroughly to all employees in the logistics department. Moreover, there was no clear strategic plan for the business operation of transportation, no provision of additional logistic services beyond transportation, and no continuous involvement in transportation development with the Department of Land Transportation through professional councils or associations. In the operational aspect, the organization had not standardized the speed control and driving behavior of its drivers, nor was there found to be any emergency management training during transportation. In the employee aspect, there was a lack of comprehensive communication to all employees regarding work regulations and disciplinary actions. Additionally, there was no plan to foster professional pride among drivers, and the driver employee roster was incomplete. In the vehicle aspect, the organization had not conducted an in-depth analysis of transportation costs to determine improvement strategies, nor installed additional truck safety equipment. There was also no clear summary or plan for environmental performance improvement of the vehicles. In the customer and external aspect, it was observed that the organization did not collect detailed customer data, nor did it have a comprehensive and clear plan for customer meetings.

Objective 2: To propose strategies and develop the trucking service quality for Haad Thip Public Company Limited according to the Q Mark standard criteria and to proceed with the standard certification application. From the operational details that do not comply with the requirements in each aspect, the researcher proposed operational strategies for rectification, improvement, and development to align with the criteria. For the organizational aspect, it was recommended to create and communicate Job Descriptions (JDs) for all positions and to inform all employees, including management structures. Additional communication channels for policies beyond announcements, such as regular employee communication meetings with documented attendance, were suggested. Clear strategic planning for the transport business operation should be established and communicated to all employees. Membership in the Southern Transport Association and others was advised, along with plans for additional logistic services such as warehouse management. For the operational aspect, the installation of a Telematic system to analyze and modify the driving behavior of drivers towards safety was recommended, along with at least an annual emergency management training. A clear plan to foster professional pride among drivers was also suggested. For the employee aspect, additional communication channels for work regulations and disciplinary actions beyond announcements were recommended, along with a detailed and redesigned Driver Matrix. For the vehicle aspect, an in-depth analysis of transportation costs with clear corrective and preventive measures was suggested. The installation of a Telematic system for detailed analysis of the driving behavior of drivers towards safety and a plan for studying and summarizing environmental performance improvement of the vehicles were advised. For the customer and external aspect, collecting additional data beyond direct customer information and organizing quarterly customer meeting plans were recommended.

The success of improving the trucking service quality of Haad Thip Public Company Limited according to the Q Mark standards was attributed to several effective actions across various dimensions, as follows: **(1) Clear Strategies and Planning:** Well-defined strategies and plans are crucial for providing direction and ensuring stability in operations. Clear strategic planning, including business operation plans and participation in industry associations, was recommended to align the organization's objectives with industry standards and requirements; **(2) Systematic Communication:** Systematic communication channels help in sharing information and presenting beneficial operational plans. Organizing regular meetings with documented attendance and effective communication of policies beyond mere announcements facilitate better understanding and compliance among employees; **(3) Defined Task Assignments:** Clearly defining roles and responsibilities for all employees ensures efficient operations. Establishing comprehensive job descriptions and redesigning employee matrices help in clarifying duties and enhancing accountability across all levels of the organization; and **(4) Theory Verification and Application:** Analyzing results and applying theoretical frameworks or management processes are vital steps in continuous improvement. By evaluating outcomes and adjusting operations accordingly, the organization ensures alignment with improvement plans and achieves the desired objectives.

Through the implementation of these strategies and recommendations, Haad Thip Public Company Limited successfully improved its trucking service quality and obtained certification according to the Q Mark standards from the Department of Land Transport. This certification serves as a significant indicator of the organization's commitment to quality and reliability in the transportation industry.

In summary, the discussion on developing the trucking service quality of Haad Thip Public Company Limited according to the Q Mark standards shows that the case study company implemented corrections, improvements, and developments based on all proposed operational strategies. Subsequently, the company applied for and successfully received certification of the Q Mark standard from the Department of Land Transport.

Recommendations

For the research on developing the trucking service quality of Haad Thip Public Company Limited according to the Q Mark standards, the researcher offers recommendations divided into two parts as follows:

1. Recommendations for Haad Thip Public Company Limited

1.1 The company should engage in public relations activities to promote and support the Q Mark standard system, including academic publications related to quality systems to ensure all employees are informed and understand the details of the standards and the associated benefits comprehensively.

1.2 The company should monitor operations continuously to foster improvements and developments within the system by establishing regular reviews by an internal auditor team.

2. Recommendations for Future Research

2.1 Future studies should continuously track the Department of Land Transport's standards as they may be updated according to future situations.

2.2 Future research should integrate other quality systems such as Fleet Safety, Route to Market, etc., to enhance the depth and maximize the efficiency of the research.

Author contributions

All researchers were involved in concept, design, collection of data, interpretation, writing, and critically revising the article. All authors approved the final version of the article.

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Ethics declaration

Authors declared that the participants were assured that their participation is voluntary and that they can withdraw from the study at any time. The data collected from the participants was kept confidential and anonymous, and the data was only be used for research purposes. Authors further declared that the study complied with ethical guidelines set forth by the Institutional Review Board of the human research ethics committee of Nakhon Ratchasima College (NMCEC-0015/2566), Thailand.

Declaration of interest

Authors declare no competing interest.

Data availability

Data generated or analyzed during this study are available from the authors on request.

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