Enhancing Data Privacy Compliance Through Logistics Service Quality: A Strategic Framework for Thailand's Logistics SMEs

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Abstract

This study investigates the causal relationships among logistics service quality (LSQ), customer confidence (CFD), and the intention to comply with the Personal Data Protection Act (PDPA) within small and medium-sized enterprises (SMEs) in Thailand's logistics sector. It hypothesizes that customer confidence functions as a mediating variable linking LSQ and compliance intention. A mixed-methods research design was adopted. The quantitative phase involved data collection from 400 participants using a five-point Likert scale questionnaire. Data were analyzed through structural equation modeling (SEM). The qualitative phase comprised in-depth interviews with 30 executives and subject-matter experts, with data analyzed using thematic analysis.

Quantitative findings reveal that LSQ has a statistically significant positive influence on CFD, which, in turn, significantly affects the intention to comply with the PDPA. CFD is confirmed as a full mediator between LSQ and compliance intention. The model demonstrates excellent fit indices (CFI = 1.000, RMSEA = 0.000, GFI = 0.993). Qualitative results highlight key organizational development strategies, including PDPA training, data governance practices, cybersecurity integration, and the implementation of ISO/IEC 27001 standards. Based on the empirical evidence, this study proposes a three-step strategic framework to enhance PDPA compliance among SMEs: (1) optimizing logistics processes, (2) promoting transparency in data management, and (3) developing standardized procedures aligned with the law. This framework aims to foster customer trust and encourage sustained compliance, while supporting the United Nations Sustainable Development Goals (SDGs 9, 12, and 16).

Keywords: Logistics Service Quality, PDPA, Legal Compliance, Customer Confidence, Strategic Framework, SMEs in Thailand

Introduction

In the data-driven digital economy, Thailand's logistics sector faces increasing pressures from technological innovation, operational transformation, and evolving regulatory requirements. A key legislative milestone is the enactment of the Personal Data Protection Act B.E. 2562 (PDPA), which establishes new standards for the collection, use, and protection of personal data. This has compelled logistics enterprises-particularly small and medium-sized enterprises (SMEs)-to urgently adapt in order to ensure effective legal compliance. Concurrently, as a member of the United Nations, Thailand is committed to advancing the Sustainable Development Goals (SDGs), notably SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 16 (Peace, Justice, and Strong Institutions), all of which emphasize transparent, resilient, and accountable systems (United Nations, 2015).

While large enterprises often have adequate resources to implement data governance systems aligned with PDPA standards, SMEs frequently face significant constraints in terms of financial capacity, regulatory knowledge, and skilled personnel. In response, this study proposes a strategic framework that emphasizes enhancing PDPA compliance through the improvement of logistics service quality (LSQ). The study argues that LSQ—comprising key dimensions such as accuracy, responsiveness, reliability, and transparency—plays a critical role in building customer confidence in an organization's data management practices, which, in turn influences their intention to comply with data protection standards in a sustainable manner.

Research Objectives

1. To examine the effects of logistics service quality on customer confidence and its impact on the intention to comply with the Personal Data Protection Act (PDPA) among logistics SMEs in Thailand.

2. To develop a strategic framework for enhancing PDPA compliance by leveraging logistics service quality and customer confidence as key driving mechanisms.

Literature Review, Conceptual Framework

This literature review focuses on key theoretical foundations related to logistics service quality (LSQ), customer confidence (CFD), and the intention to comply with the Personal Data Protection Act (PDPA). The central emphasis lies in the role of LSQ in fostering trust in organizations and promoting acceptance of personal data protection practices.

The concept of LSQ was developed by Parasuraman, Zeithaml, and Berry (1988) under the SERVQUAL model, which consists of five core dimensions: reliability, responsiveness, assurance, empathy, and tangibles. These dimensions have been adapted to the logistics context to evaluate customer service experiences (Maltz, 1998; Lin et al., 2023). Meanwhile, customer confidence has been proposed as a critical mechanism linking perceived service quality with behavioral acceptance and adherence to data handling practices (Bart et al., 2005; Mukherjee & Nath, 2007). This proposition aligns with the work of DeLone and McLean (2008) and Petter et al.

(2013), who identified confidence as a key mediator in information systems that influences natural system adoption, especially in contexts where transparency is paramount—such as in personal data management systems.

In terms of legal compliance, the PDPA is a regulatory framework that drives organizational transformation. Cornish (2020) and Siti Seli'ah et al. (2021) suggest that organizations fostering transparency and data literacy are more likely to reduce resistance to new compliance mandates. This is particularly effective when technologies such as artificial intelligence (AI) and data visualization are employed to support internal learning and governance within SMEs.

The notion of a compliance roadmap is thus centered on designing actionable strategies tailored to the limitations and realities of small logistics businesses in Thailand (Nimnu, 2022; Deskaug, 2022). Ultimately, aligning LSQ development with customer confidence—and subsequently promoting sustainable PDPA compliance—forms a conceptual framework that addresses academic, business, and policy dimensions in advancing Thailand's logistics sector in the digital age.

Research Methodology

This study employed a quantitative research design with the objective of investigating the causal relationships among three primary latent variables: Logistics Service Quality (LSQ), Customer Confidence (CFD), and the Intention to Comply with the Personal Data Protection Act (PDPA) (INT). Structural Equation Modeling (SEM) was applied to analyze the structural relationships between these variables and to construct a strategic framework that can be practically applied in the logistics business sector.

Sample and Sampling Method

The sample consisted of 400 executives or business owners from small and medium-sized enterprises (SMEs) operating in the logistics sector in Thailand. A multistage sampling technique was employed, based on enterprise classification criteria defined by the Office of Small and Medium Enterprises Promotion (OSMEP).

Research Instrument

Data were collected using a structured questionnaire employing a five-point Likert scale. The questionnaire comprised three sections: (1) general business information, (2) indicators measuring LSQ, CFD, and INT, and (3) opinions regarding PDPA compliance. The content validity of the instrument was verified by five experts. Instrument reliability was assessed using Cronbach's alpha coefficient, yielding high reliability across constructs. LSQ = 0.913, CFD = 0.915, INT = 0.912, overall reliability = 0.928

Data Analysis

Both descriptive and inferential statistical analyses were conducted using intermediate and advanced statistical software. Descriptive statistics included frequency, mean, and standard deviation. SEM was used to evaluate the goodness-of-fit between the proposed model and the empirical data. Model fit indices were as Chi-square/df = 0.707, p-value = 0.838, GFI = 0.993, CFI = 1.000, RMR = 0.003, RMSEA = 0.000

These results, illustrated in Figure 2 (Structural Equation Model - SEM), indicate a strong fit between the model and the empirical data, supporting the hypothesis that LSQ has a significant positive influence on CFD, which in turn significantly affects INT. The findings suggest that enhancing logistics service quality can serve as a strategic mechanism to foster customer confidence and encourage sustainable compliance with PDPA among logistics SMEs in Thailand.

Research Findings and Discussion

The study investigated the effects of logistics service quality (LSQ) on customer confidence (CFD) and its impact on the intention to comply with the Personal Data Protection Act (PDPA) among logistics SMEs in Thailand. The structural equation modeling (SEM) results indicated that LSQ had a statistically significant positive direct effect on CFD ($p < 0.01$). Furthermore, CFD played a significant mediating role in influencing the intention to comply with the PDPA. Notably, no direct effect was found between LSQ and the intention to comply (INT), confirming that customer confidence serves as a key mechanism driving sustainable behavioral acceptance of personal data management practices. The model demonstrated excellent goodness-of-fit indices, including Chi-square/df = 0.707, p-value = 0.838, CFI = 1.000, RMSEA = 0.000, GFI = 0.993, and RMR = 0.003. These indicators confirmed the model's robustness in explaining the structural relationships among latent variables. The findings affirm that enhancing LSQ can strategically foster customer trust, which in turn supports voluntary and sustained compliance with the PDPA within Thailand's SME logistics sector.

These findings are consistent with prior research by DeLone and McLean (2008) and Petter et al. (2013), which emphasized the importance of service quality in building trust and satisfaction within information systems, leading to behavioral acceptance. Similarly, Bart et al. (2005) and Mukherjee and Nath (2007) found that customer confidence plays a critical role in shaping positive attitudes toward digital systems and personal data practices. The development of a strategic compliance framework was another key outcome of this study. It emphasizes that the PDPA should not be perceived solely as a regulatory burden but as an opportunity to enhance service quality standards—particularly in SMEs, which often face limitations in resources, legal knowledge, and operational capacity. The proposed framework encourages SMEs to begin by improving LSQ elements such as accuracy, transparency, responsiveness, and accessible communication, which，in turn foster customer trust and support the acceptance of PDPA principles.

Furthermore, the use of enabling technologies such as artificial intelligence (AI) and data visualization is proposed to improve operational understanding and employee engagement. These strategies align with organizational governance principles and the United Nations Sustainable Development Goals (SDGs 9, 12, and 16), helping Thai logistics businesses comply effectively with the PDPA while advancing toward sustainable growth in the digital economy.

This discussion reinforces the position that LSQ is a critical entry point for building trust in personal data systems—particularly for SMEs with structural limitations. Supported by well-established theories such as Bandura's (1986) social cognitive theory and Ajzen's (1991) theory of planned behavior, the findings highlight the

role of positive attitudes and trust in influencing compliance behavior. Cornish (2020) further argues that organizations emphasizing trust and transparency in data governance are more likely to achieve sustainable compliance. Similarly, Siti Seli'ah et al. (2021) demonstrated that technology tools such as AI and data visualization can enhance understanding of data policies and reduce resistance to organizational change.

In summary, the study confirms that strengthening LSQ is a foundational strategy for cultivating customer confidence, which plays a pivotal role in enabling sustainable PDPA compliance, especially within resource-constrained SME environments. These findings provide an evidence-based roadmap for designing data governance policies and ethical service systems that are transparent, secure, and socially accountable.

Recommendations

Practical Implications

The study revealed that logistics service quality (LSQ) has a significant direct influence on customer confidence (CFD), which in turn plays a mediating role in shaping the intention to comply with the Personal Data Protection Act (PDPA) among logistics SMEs. No direct effect was found between LSQ and compliance intention, highlighting the pivotal role of CFD as a behavioral driver of sustainable data protection practices. This finding supports the conceptual models of DeLone and McLean (2008), Petter et al. (2013), and Bart et al. (2005), which emphasize the influence of service quality in fostering trust and behavioral acceptance toward new systems or practices. It also aligns with the theoretical frameworks of Bandura (1986) and Ajzen (1991), which propose that confidence and positive attitudes lead to sustained behavioral outcomes.

The study proposes a strategic approach in which SMEs reframe the PDPA not as a regulatory burden, but as an opportunity to elevate service quality standards. Starting with the development of LSQ-particularly focusing on accuracy, transparency, responsiveness, and clear communication—can help build customer trust and facilitate voluntary legal compliance. Moreover, the adoption of enabling technologies such as artificial intelligence (AI) and data visualization can enhance internal communication and data understanding. These insights resonate with the work of Cornish (2020) and Siti Seli'ah et al. (2021), who argue that transparency and emphasis on personal data governance significantly contribute to sustainable policy adherence at the behavioral level.

Suggestions for Future Research

1. Explore the application of digital technologies in enhancing PDPA compliance among logistics SMEs in Thailand.

2. Investigate the role of organizational culture and data awareness in shaping PDPA compliance behavior among SME operators in the logistics sector.

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