

Enhancing the Passenger Experience: Investigating Service Quality, Image, and Motivation Factors for Thailand's Train Transport Sector

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Abstract. This study analyzed factors influencing rail passenger satisfaction levels amongst 1,250 travelers on Thailand's State Railway System (SRT). Organizational image, service quality and staff motivation were proposed as key drivers based on previous evidence. Survey data was rigorously analyzed using structural equation modeling. Findings reveal service quality as the top contributor to satisfaction, highlighting areas for improvement like reliability and safety. The research affirms the interconnectivity between variables in shaping the passenger experience. While focused only on SRT, insights on catering services to meet expectations can inform regional transport policy and planning. As limitations, incorporating other Thai rail systems and tourism growth estimates could enrich the practical value.

Keywords: ASEAN Economic Community (AEC), Belt Road Initiative (BRI), Service Quality, Service Satisfaction, Thailand, Trans-Asian Railway

1. Introduction

The ASEAN Economic Community (AEC) is a collaborative effort among ten Southeast Asian nations. The main objective of the AEC is to establish an integrated economic region with a unified market and production base, following ASEAN policies to ensure economic preparedness. Thailand recognizes its role in driving the country's progress to keep pace with the growing regional economy and align with the United Nations' 2030 Sustainable Development Goals (SDGs). These SDGs utilize a multidimensional framework emphasizing the interconnectedness of the economy, society, and the environment (United Nations, 2015).

In Thailand, the Ministry of Transport and the Ministry of Industry are vital agencies responsible for pursuing SDG Goal 9, which focuses on developing long-lasting infrastructure, inclusive and sustainable industrialization, and promoting innovation. SDG 9.1 outlines specific targets that Thailand aims to achieve. These include the development of high-quality, reliable, and robust infrastructure within the country and across regional borders. The objective is to support sustainable economic growth and ensure equitable access for all citizens at an affordable cost.

Thailand's 20-year national transportation development strategy aligns with this goal, which the government has prioritized. Thailand has also developed a 20-year development strategy (2017-2036) comprised of six strategies, including 1) strategy for security and safety, 2) strategy for enhancing competitiveness, 3) strategy for developing and improving human capacity, 4) strategy for creating equal opportunities and social equality, 5) strategy for sustainable growth in a friendly environment, and 6) strategy for balancing and developing the public sector management system ("20-year National Strategy comes into effect," 2018).

As Thailand is a member of the ASEAN group of countries and is located at the center of the member countries, it is suitable to be a hub for industrial goods transportation in the region and the world (Jiang, 2019). To enhance resilience and take advantage of potential opportunities, it is necessary to prepare for physical linkages of transportation infrastructure and logistics systems (Phaicharoen, 2024). along with upgrading the quality of human resources to drive Thai and regional economic and social development (Rattanaarun et al., 2023).

The State Railway of Thailand (SRT) is a government-owned company created in 1951 to provide railway transportation services to the public, the state, and other organizations. The SRT has a plan called the National State Enterprise Strategy for 2017-2021, which aims to offer convenient, safe, fast, and affordable services. The SRT also plans to provide internationally standardized and diverse railway transportation services, make the railway the primary mode of transportation within Thailand, connect it with the road system, increase the number of railway lines that connect cities and industrial areas, connect with neighboring countries, and make Thailand a central transportation hub in the region.

However, as numerous studies have pointed out, state-run organizations need help implementing these plans. In one case study, Musanzikwa and Ramchander (2018) studied state-owned enterprises (SOEs) in Zimbabwe. They found that these companies needed to do better in making enough money, making their customers happy, or having good internal processes. These negative factors meant that the companies needed help to achieve their goals for learning and growth.

Another problem is that the culture within these companies needed to be stronger. This has made it difficult for the companies to be flexible and provide timely goods and services. It has also affected the behavior of the employees and indirectly affected customer satisfaction, cost-saving, and profitability in the companies.

Organizational culture plays a pivotal role in shaping the dynamics of rail public transportation systems, influencing both the workforce and the passenger experience (Sivalai & Rojniruttikul, 2018). In a study by Ravasi and Schultz (2006), the authors examined the foundational aspects of organizational culture, emphasizing its role in creating a shared understanding of values and beliefs among employees. A positive organizational culture fosters a sense of purpose, pride, and engagement among employees (Ababneh, 2021). The adaptability and innovation encouraged by organizational

culture are also crucial in addressing the dynamic challenges faced by rail transportation systems. The work of Cameron and Quinn (2011) provides insights into how organizational culture influences adaptability and innovation, emphasizing the impact on employee motivation and satisfaction.

Consistency in service is another hallmark of a strong organizational culture (Lyons et al., 2007). In a study by Wongthongchai (2022) the role of service quality in public transportation services in Thailand was explored. From the 473 passengers surveyed, the authors established that passenger satisfaction is affected by three service quality attributes, including empathy, tangibility, and reliability.

As mentioned in the previous passage, the problems faced by the Zimbabwean state-owned enterprises are similar to the findings of Ugo (2014) in a study on South African rapid bus service, who found that commuters wanted better transport fares and the availability of ticket sales outlets. Therefore, City of Cape Town policymakers and planners should focus on improving the responsiveness and affordability of the public transport system. This study also highlights the need to keep track of service quality trends in public transport (Bucu et al., 2023).

Maluleke (2013) also researched South Africa and found that transportation users have a fundamental need to travel between two locations. During the journey, the operator is responsible for passenger safety and security, as well as providing a transport system that is reliable, accessible, and affordable. As people become wealthier, their transportation needs become more complex and require better public transportation options. Thus, rail transport systems are a crucial part of the economy, and investment in newer technologies, rolling stock, and infrastructure can lead to innovation, competition, and improved quality of life.

Improvements in life quality are consistent with a study from Eboli and Mazzulla (2015) from Northern Italy in which the authors stated that an increase of public transport use is an excellent way to reduce urban congestion, pollution, and noise associated with private car use. Likewise, a study on job satisfaction among railway employees in India highlighted the pivotal role of staff contentment in the railway's overall success (Ramesh & Katta, 2022). The rationale lies in the fact that contented employees contribute positively to railroad operations by enhancing productivity and efficiency.

1.1. Bridging the Gap: Unveiling the Imperatives of Rail Passenger Satisfaction Research

The introduction to our study delves into the landscape of the ASEAN Economic Community (AEC), Thailand's commitment to sustainable development, and the pivotal role of the State Railway of Thailand (SRT) in achieving national transportation goals.

To bridge this gap effectively, it is imperative to underscore the specific problems and Thailand's declining trends that propel our inquiry into rail passenger satisfaction (Lieophairot & Rojniruttikul, 2023). The contemporary landscape of the transportation sector, both globally and within the ASEAN region, has witnessed transformative shifts in consumer expectations, technological advancements, and organizational dynamics. These shifts present challenges and opportunities, making it essential to scrutinize the numerous aspects of rail passenger satisfaction.

In recent years, the global transport industry has experienced a paradigm shift driven by changing consumer expectations and technological disruptions. Passengers are no longer mere recipients of transportation services; they have evolved into discerning consumers with heightened expectations for quality, efficiency, and safety. In the context of rail transportation, this transformation is evident in the growing demand for not just reliable services but an elevated passenger experience encompassing comfort, safety, and convenience.

Moreover, the advent of digital technologies (Lyons et al., 2016), as evidenced by blockchain implementations (Yan et al., 2022) and the Internet of Things (IoT), has introduced novel dimensions to the transportation and international logistics sector. The integration of these technologies necessitates an in-depth exploration of their impact on service quality and passenger satisfaction, particularly in cross-border e-government document interchange architectures (Thoppae & Praneetpolgrang, 2021). Matyushenko et al. (2022) have also suggested that the path to technological competitiveness passes

through ensuring a robust digital economy through regional innovation clusters and research institute creation. By so doing, exports are increased which then can stimulate foreign investment and improve legislation.

In the ASEAN region, with Thailand at its heart, the pursuit of sustainable development goals and economic preparedness places the spotlight on the transportation sector's role (Phaicharoen, 2024). As Thailand positions itself as a regional hub for industrial goods transportation, the challenges and opportunities associated with such a pivotal role warrant meticulous examination. Issues related to infrastructure development, logistics systems, and the quality of human resources become focal points in understanding how Thailand can maximize its potential and contribute to regional economic and social development.

Drawing parallels from relevant studies on state-owned enterprises in Zimbabwe (Musanzikwa & Ramchander, 2018) and public transport systems in South Africa (Ugo, 2014), we find common threads of challenges faced by such organizations. These challenges, encompassing financial sustainability, customer satisfaction, service quality, staff motivation, and internal processes, resonate with the predicaments encountered by the State Railway of Thailand (SRT). By acknowledging these shared challenges, we pave the way for a more detailed exploration of the SRT's unique context within the broader landscape of international rail and logistics transportation.

In essence, our research is not merely an exploration of rail passenger satisfaction within the confines of Thailand but a response to the dynamic shifts and challenges that define contemporary rail transportation globally. On a positive note, various studies and scholar have reported that in Great Britain over a 10-year period (2004-2014), rail commuters actually increased significantly (50%) (Lyons et al., 2016). Another report has stated that UK passenger traffic has grown faster than in any other major EU system (Jupe & Funnell, 2017). Additionally, the UK system has become the second safest in the EU and customer satisfaction levels are reported higher than most major EU railways. Furthermore, various studies have reported that increased ridership can be attributed to a growing demand for rail travel, rail privatization, increased investment, road congestion, higher road taxes, cost of vehicle and insurance, and the rise of the digital tools and platforms (Davies-Slate, 2020).

In India, Nandan (2010) examined how railway platforms affected passenger satisfaction and service quality. The author concluded that of the five factors considered, the most crucial were refreshments and behavioral factors. In Taiwan, Chou et al. (2014) researched how customer satisfaction and service quality affected passenger loyalty. The authors concluded five SQ elements were essential. Reported in order of importance, these were coach cleanness, staff neatness, service attitude, climate control, arrival timeliness.

In mainland China, Wang et al. (2020) also investigate SQ and CS on commuter rail reuse intention. Their findings suggest that SQ is functional, technical, comfort, cleanliness, and service planning and reliability. This is consistent with de Oña et al. (2016) in Northern Italy who stated that SQ is the foundation on which public transport attracts passengers. In Malaysia and Thailand, Melan et al. (2021) suggested that SQ, reliability, facilities and accessibility play essential roles in passenger satisfaction for rail services.

By highlighting the specific problems and declining trends in Thailand shaping the context of our inquiry, we aim to contribute valuable insights that also transcend geographical boundaries, informing policies, and strategies not only for the SRT but also for analogous transportation organizations worldwide. Therefore, as we embark on this research journey, our commitment is not just to unravel the intricacies of rail passenger satisfaction but to fill the identified gap by dissecting the challenges, trends, and opportunities that define the contemporary landscape of the global rail transportation sector.

Therefore, aligning with insights from global studies, the outcomes of this research aim to deepen the understanding of passenger satisfaction in Thailand and worldwide (Chen et al., 2021; Eboli & Mazzulla, 2015; Tahanisaz, 2020; Zefreh et al., 2020). The study endeavors to shed clearer light on the factors significantly influencing passenger satisfaction, offering a more transparent and realistic

perspective. The insights gained regarding the determinants of rail passenger satisfaction can prove valuable for pertinent organizations, aiding in the formulation of policies and strategies to elevate the quality and efficiency of train services in Thailand. Additionally, the study holds potential in fortifying the organizational image and reputation of the SRT, fostering increased customer satisfaction and service quality. Therefore, the established research questions are proposed:

1.2. Research Questions

1.2.1. *Organizational Image (OI)*

- How does group reputation (OI01) influence the overall organizational image within the State Railway of Thailand (SRT)?
- In what ways does brand perception (OI02) contribute to the organizational image perceived by rail passengers?
- To what extent do products and offerings (OI03) shape the organizational image of the SRT from the perspective of rail passengers?

1.2.2. *Service Quality (SQ)*

- How do observable attributes (SQ01) impact the perceived service quality of rail transportation services provided by the SRT?
- To what extent does the proof (SQ02) of service quality influence passenger perceptions within the context of the SRT?
- In what ways do consistency (SQ03), timeliness (SQ04), and confidence (SQ05) contribute to the overall service quality experienced by rail passengers?

1.2.3. *Service Motivation (SM)*

- How do feelings (SM01) of service personnel impact their motivation levels within the SRT?
- In what ways does logic (SM02) contribute to the motivation levels of service personnel in delivering rail transportation services?

1.2.4. *Rail Passenger Service Satisfaction (RPSS):*

- To what extent does service fairness (SS01) contribute to overall passenger satisfaction with rail services provided by the SRT?
- How does on-time delivery (SS02) influence the satisfaction levels of rail passengers within the SRT?
- In what ways does satisfactory service (SS03), uninterrupted service (SS04), and evolving service (SS05) collectively contribute to rail passenger service satisfaction?

2. Literature Review

2.1. Organizational Image (OI)

Organizational Image (OI) encompasses various dimensions crucial to how a company is perceived, including its personality, identity, and communication strategy (Keller, 1993). Kotler and Keller (2012) later defined OI as the collective beliefs, attitudes, and impressions held by individuals about a company, emphasizing its significant impact on marketing efforts by influencing public perception.

A study in Finland (Nurmikolu & Guthrie, 2013) highlighted the role of maintenance and rehabilitation strategies in improving safety, service life, and reducing life cycle costs, thereby enhancing the quality of bus and train services and contributing to an overall improvement in organizational image. Similarly, research in China (Ni et al., 2020) emphasized the crucial role of organizational image in shaping perceived service quality and the direct value of public transportation organizations, focusing on commuter satisfaction factors such as comfort, safety, reliability, convenience, economy, and speed.

In the aviation industry, Taskiran and Gökçe (2017) underscored the critical importance of OI in a highly competitive environment, revealing that staff significantly shape OI, impacting stakeholders and

passengers alike. This aligns with Keller and Richey's (2006) findings that an organization's brand personality is reflected in its employees' words, values, and actions.

Emphasizing OI's multifaceted nature, studies by Lopez et al. (2011) and Sadiartha and Darmiyanti (2019) affirm that it encompasses identity, personality, and communication strategy, influencing the strength of organizational/country associations in people's minds and positively affecting consumers' views and public perceptions, thereby influencing marketing efforts.

To enhance satisfaction in public transport organizations, focusing on comfort, convenience, and safety is paramount (Ni et al., 2020), influencing the overall experience and perception of public transportation services. Based on this comprehensive overview of Organizational Image (OI), two hypotheses are proposed:

H1: OI directly and positively affects SQ.

H2: OI directly and positively affects SM.

2.2. Service Quality (SQ)

Evaluating SQ is problematic because it involves many different factors that contribute to overall quality, which are perceived differently by different customers. However, SQ is important in understanding customer satisfaction because it includes all the characteristics of a service that affect how well it meets customers' needs and expectations.

Regarding public transportation, service quality is measured by how well a service meets or exceeds commuters' expectations. This includes factors like comfort, journey duration, and the availability of support systems. Service quality is closely tied to customers' expectations, perceptions, satisfaction, and attitudes. The literature review about public transport SQ also shows that commuters judge the performance of the transport system based on their perceptions of it (Currie & Wallis, 2008). Commuters can choose between different modes of transport, each with advantages and disadvantages (Gärling, 2005). Their expectations and perceptions are essential for the quality of service, but they are only sometimes based on reality (Davidoff, 1994).

A study by Vilakazi and Govender (2014) found that public bus comfort, reliability, comfort, how well their service, and their related safety significantly influence the commuter perception of overall SQ. Interestingly, comfort and service have adverse effects, while reliability and safety have positive effects. Another study by Kaewwongwattana et al. (2015) examined how a standard ticketing system could benefit commuters in Bangkok. The study found that external variables such as family members, colleagues, and marketing significantly influence passenger decision-making. In contrast, personal habits have a direct but limited effect.

Numerous studies have acknowledged that the satisfaction construct is intricate, mainly due to the interrelationship between assessment attributes, which represent the general criteria for evaluating service quality (SQ) in assessing satisfaction. Additionally, situational differences can arise from consumers' quality perceptions, adding to the complexity (Calabrese & Scoglio, 2012; Parasuraman et al. 2005; Zayer et al., 2015). As a result, SQ perceptions play a crucial role in influencing customer satisfaction (Burton et al., 2003).

Ettema et al. (2011) studied undergraduate subjective well-being (SWB) and its use as a measurement tool. The results revealed that STS is reliable and can differentiate between changes in travel conditions such as car vs. bus, travel time, bus stop access, and each student's daily agenda. Nandan (2010) also stated that SQ is how a commuter perceives how effectively a transport service meets or exceeds expectations. Litman (2008) added that the transport sector SQ could be measured according to customers' attitudes, expectations, perceptions, and satisfaction. Therefore, SQ travel encompasses multiple aspects, including vehicle comfort, trip duration, and infrastructure support systems.

From the overview of service quality (SQ), the following two hypotheses are proposed:

H4: SQ directly and positively affects SM.

H5: SQ directly and positively affects RPSS.

2.3. Service Motivation (SM)

In recent years, the challenges faced by staff involved in service motivation (SM) within public sector enterprises, particularly in fields such as rail transportation and service maintenance, have been the subject of numerous studies (Hitka et al., 2020; Lieophairot & Rojniruttikul, 2022; Polanant & Rojniruttikul, 2022). These investigations consistently highlight the direct impact of employee service motivation on various facets, including work outcomes, organizational development, and overall effectiveness.

A critical aspect revealed by these studies is the relationship between employee service motivation and the work environment, as well as career development (Iis et al., 2022). Career development, in particular, has been identified as a key determinant influencing worker performance and motivation (Khan, 2012). The interplay of these elements contributes to shaping the needs, feelings, and reactions of staff, which are often influenced by the pressure to meet organizational requirements and goals (Koontz & Weihrich, 1993).

In the realm of employee motivation, the discussion often delves into the concepts of extrinsic and intrinsic motivation within the framework of Self-Determination Theory (SDT) (Ryan & Deci, 2020). Extrinsic motivation involves seeking external rewards or avoiding negative consequences, while intrinsic motivation is closely linked to the satisfaction derived from personal achievement (Prapatsaranon et al., 2022).

Victor Vroom's Work and Motivation is a seminal work frequently referenced in the field of workplace motivation. Vroom's insights, particularly through the lens of the Expectancy Theory of Motivation (ETM), provide valuable guidance for frontline managers aiming to enhance employee motivation (Lloyd & Mertens, 2018). The ETM posits that specific attitudes among staff can lead to actions and job performance, influenced by their abilities, personalities, experiences, skills, and knowledge in their respective fields (Khan et al., 2020). Vroom underscores the intrinsic connection between an employee's effort and motivation (Lieophairot & Rojniruttikul, 2022).

Therefore, the interplay of organizational factors, career development, and motivational frameworks significantly influences employee service motivation, subsequently impacting work outcomes and organizational effectiveness. This then leads to the conceptualization of the following hypothesis:

H6: SM directly and positively affects RPSS.

2.4. Rail Passenger Service Satisfaction (RPSS)

The definition of customer service varies across industries, encompassing diverse factors that determine the quality of service provided. The effective execution of these factors plays a pivotal role in shaping whether the service is perceived as satisfactory or inadequate. It is widely asserted that exceptional customer service not only ensures customer satisfaction but also contributes significantly to fostering a positive and enduring customer experience (Marquardt et al., 2017). Jahanshahi et al. (2011) also emphasized the critical role of customer service in sustaining profitability, stating that improved customer service positively influences various facets such as perceived product quality, competitive advantage, sales, and income.

The measurement of customer service yields substantial benefits for businesses by providing insights into customers' perceptions of "good service quality" (Getty & Getty, 2003). Through a detailed analysis of customer service experiences, firms can gain a deeper understanding of consumer needs and preferences. This heightened awareness empowers businesses to proactively anticipate and tailor their services to meet specific customer expectations during and after each service encounter (Pantouvaki, 2010). In essence, the systematic measurement of service quality enables companies to refine their

offerings, thereby delivering more satisfying and personalized customer experiences.

Raza et al. (2022) underscores the imperative for organizations to bridge evident service gaps to enhance customer satisfaction. The study reveals key passenger expectations, including convenient operating hours, secure transactions, well-groomed employees, accurate information on service schedules, and the fulfillment of promised services. The findings highlight the need for Gautrain operators to enhance services across all dimensions, particularly in assurance and responsiveness. This necessitates strategic planning, prioritization of services, and a thorough review of processes aligned with customer expectations. Therefore, drawing insights from the literature and theoretical frameworks, the authors propose six hypotheses (Figure 1) to guide further exploration and understanding of rail passenger service satisfaction.

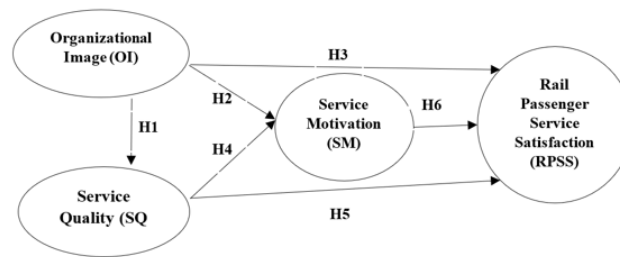


Fig. 1: Rail passenger service satisfaction conceptual model
Source: The authors.

3. Methods

3.1. Research Design and Qualitative Validation

The study adopted a mixed-methods design to ensure a comprehensive understanding of Thai rail passenger service satisfaction. Initially, qualitative research was conducted to validate the research design and refine the research scale (Khoa et al., 2020). A purposive sampling technique was employed to select five experts who participated in a focused group discussion, lasting 120 minutes, convened in the faculty's graduate student conference room.

This study utilized a mixed methods design to comprehensively explore passenger satisfaction with Thai rail services. Initially, qualitative research was conducted to validate the research design. Following the approach by Khoa et al. (2020), a purposive sampling technique was employed to select five experts. These experts participated in a 120-minute focus group discussion held in the faculty's graduate student conference room. The panel included three university professors holding doctorate degrees in Logistics, Industrial Management, and Measurement and Evaluation, along with two experts from the State Railway of Thailand. The latter comprised experts in bus operations and the public relations department.

During the focus group discussion, these experts collectively provided insights and suggestions on the topic of passenger service satisfaction, identifying components and factors influencing service satisfaction. The researcher then synthesized and analyzed these expert opinions to formulate a questionnaire. This questionnaire was subsequently sent back to the experts for evaluation of the IOC, ensuring alignment with the study's objectives.

3.2. Content Validity Assessment

Following the discussion, a content validity assessment of Parts 2-5 was conducted using the item-objective congruency (IOC) index as a validation tool (Ditsuwan & Sukkamart, 2022). Items with IOC values $\leq .50$ underwent revision or elimination based on expert feedback. Data normality assessment involved skewness and kurtosis p-values, aligning with Daengneam et al.'s (2023) recommendations, with values approaching 2.0 for skewness and 7.0 for kurtosis raising potential concerns.

3.3. Pilot Test

Prior to the final analysis involving 1,250 collected questionnaires, a pilot test was conducted on 30 independent questionnaires (Olivková, 2015). This test assessed reliability, usability, clarity, and relevance, utilizing Cronbach's α for internal consistency evaluation. The results demonstrated excellent reliability, with α values ranging from 0.86 to 0.93 for the four constructs.

3.4. Questionnaire Design and Reliability Assessment

The primary data collection tool was the Rail Passenger Service Satisfaction (RPSS) questionnaire, comprising two parts and a total of 57 items. Part 1 focused on personal passenger characteristics, while Part 2 addressed the study's four primary constructs: Service Quality (SQ), Organizational Image (OI), Service Motivation (SM), and RPSS (Table 1). A Likert-type agreement opinion scale, ranging from '5' (highest agreement) to '1' (lowest agreement), was employed in Part 2.

3.5. Reliability Assessment

To ensure the reliability of the constructs, Cronbach's alpha (α) reliability values were calculated for each construct, as detailed in Table 3. This rigorous approach not only provided an overview of the data collection process but also emphasized the methodological robustness in investigating Thai rail passenger service satisfaction, establishing a foundation for reliable and valid findings.

Table 1: The study' latent and observed variables

Study Constructs	Questionnaire Variables	Items
Organizational Image (OI) (13 items)	group reputation - OI01	05
	brand perception - OI02	05
	products and offerings - OI03	03
Service Quality (SQ) (21 items)	observable attributes - SQ01	04
	proof - SQ02	04
	consistency - SQ03	04
	timeliness - SQ04	05
	confidence - SQ05	04
Service Motivation (SM) (7 items)	feelings - SM01	04
	logic SM02	03
Rail Passenger Service Satisfaction (RPSS) (10 items)	service fairness - SS01	02
	on-time delivery - SS02	02
	satisfactory service -SS03	02
	uninterrupted service -SS04	02
	evolving service - SS05	02

3.6. Population and Sample

In a comprehensive exploration of factors influencing the service satisfaction of Thai rail passengers, the study spanned from August 2022 to October 2022, encompassing the extensive user base of the State Railway of Thailand (SRT) passenger trains, totaling 23 million individuals.

3.6.1. Sampling Strategy

To ensure robust data collection and minimize measurement error, a deliberate strategy involved acquiring 50 questionnaires from each time group and each regional line. The study adopted a multi-stage random sampling method, targeting every fifth SRT passenger at 25 stations across the Northern, Northeast, Eastern, Southern, and MaeKlong lines. This approach, consistent with recommendations from prior scholarly studies (Whittaker & Schumacker, 2022), aimed at achieving a statistically valid sample size, with a minimum target of 440 usable questionnaires.

3.6.2. Data Collection Procedure

To meet the specified target, multiple teams of university faculty graduate assistants were strategically assigned to specific stations, ensuring coverage seven days a week. Systematic random sampling selected every fifth passenger, contributing to the efficiency of the sampling process.

3.6.3. Data Collection

Data collection occurred during five specific time periods: 06:00 - 08:00, 09:01 - 11:00, 11:01 - 13:00, 13:01 - 15:00, and 15:01 - 17:00. Ten passengers were selected from each time slot, resulting in a total of 1,250 passenger questionnaires. The sampling process utilized descriptive statistics and Structural Equation Modeling (SEM) for data analysis, facilitating the evaluation of the six hypotheses.

4. Results and Discussion

This section details the outcomes derived from the rigorous data analysis, encompassing confirmatory factor analysis (CFA), the goodness-of-fit (GOF), and the Linear Structural RELation (LISREL) 9.10 structural equation model (SEM).

4.1. Rail Passenger Survey Characteristics ($n=1,250$)

Part 1 of the questionnaire delved into individual passenger and train travel characteristics, as outlined in Table 2. Among the respondents, 52.40% identified as female, while 49.92% fell within the 30 years old or under age group. The survey revealed that 65.12% of participants were either single or had recently concluded a relationship. Education-wise, 55.84% reported having an educational level below a BA/BS degree. In terms of monthly income, 51.60% earned between 10,001 and 20,000 THB (\$290-\$580), with an additional 33.60% having a monthly income of 10,000 THB (\$290) or less. Intriguingly, 35.36% of SRT rail passengers utilized the train at least ten times per week or more.

4.2. Variables Correlation Analysis

Table 2 presents the latent variable correlation coefficients, which provides insights into the relationships among the constructs. Following the recommendation by Bono et al. (2019) regarding data distribution assessment, a skewness and kurtosis test was conducted. The evaluation, emphasizing kurtosis first, adhered to the accepted values of $\leq |7|$, with skewness and kurtosis values falling within the acceptable range of -1.85 to -2.33 and 0.07 to 1.62, respectively (Table 2).

This examination of passenger survey characteristics and latent variables correlations sets the stage for the discussion of the findings and their implications, providing a comprehensive understanding of the factors influencing Thai rail passenger service satisfaction.

Table 2: Latent variable correlations and testing results

Latent Variables	OI	SQ	SM	RPSS
Organizational Image (OI)	1			
Service Quality (SQ)	.52**	1		
Service Motivation (SM)	.70**	.59**	1	
Rail Passenger Service Satisfaction (RPSS)	.46**	.47**	.68**	1
Mean	4.54	4.54	4.61	4.62
Standard Deviation (SD)	0.59	0.57	0.52	0.51
Skewness	-1.94	-2.33	-1.85	-2.17
Kurtosis	0.07	1.62	0.82	0.69
Interpretation	highest	highest	highest	highest

4.3. GoF Assessment Results

The evaluation of the causal model's validity, investigating the variables influencing RPSS, was conducted using LISREL 9.10, generating standard fit indices. These indices encompassed RMSEA

(Root Mean Square Error of Approximation) set at ≤ 0.05 , CFI (Comparative Fit Index) set at ≥ 0.90 , and SRMR (Standardized Root Mean Square Residual) set at ≤ 0.05 . The Chi-square χ^2 test was also executed, with a significance level of $p \geq 0.05$, alongside an examination of degrees of freedom (df).

Smaller Chi-square values relative to the df ($\chi^2/df \leq 2.00$) have historically indicated a favorable fit in previous research. Additional fit indices, including NFI (Normed Fit Index) with a threshold of ≥ 0.90 , RMR (Root Mean Square Residual) with a threshold of ≤ 0.05 , GFI (Goodness of Fit Index) with a threshold of ≥ 0.90 , and AGFI (Adjusted Goodness of Fit Index) with a threshold of ≥ 0.90 [55], were also employed.

In this investigation, the CFA results were aligned with the established criteria, revealing the following values: $\chi^2 = 0.74$, $\chi^2/df = 1.16$, RMSEA = 0.00, GFI = 0.99, AGFI = 0.98, RMR = 0.01, SRMR = 0.01, NFI = 0.99, and CFI = 1.00. In consideration of Cronbach's Alpha values, recommended by Shrestha (2021) with a threshold of ≥ 0.70 for item reliability, this study demonstrated robust item reliability, with Cronbach's Alpha values ranging from 0.86 to 0.93.

4.4. Latent Variable and Manifest Variable Analysis

The analysis results for the study's constructs and observed variables (Table 3).

Table 3: CFA, CR and validity

Constructs	α	AVE	CR	Observed Variables	λ	R^2
Organization Image (OI)	0.91	0.41	0.68	group reputation -OI01	0.63	0.66
				brand perception - OI02	0.60	0.60
				products and offerings - OI03	0.69	0.75
Service Quality (SQ)	0.93	0.43	0.79	timeliness - SQ04	0.62	0.38
				confidence - SQ05	0.61	0.37
				observable attributes - 01	0.76	0.58
				confidence - SQ05	0.61	0.38
				consistency - SQ03	0.66	0.54
Service Motivation (SM)	0.86	0.54	0.70	feelings SM01	0.63	0.52
				logic SM02	0.83	0.70
Service Satisfaction (SS)	0.87	0.47	0.82	fairness - SS01	0.65	0.43
				on-time delivery - SS02	0.74	0.55
				satisfactory service - SS03	0.70	0.49
				uninterrupted service - SS04	0.67	0.44
				evolving service - SS05	0.68	0.46

Note. λ = standardized factor loading

4.5. Final Hypotheses Testing

The effect results from the mediation testing on the latent variables is shown Table 4. Figure 2 presents the details from the final hypotheses testing, which reveals that all six hypotheses were supported. Moreover, the variability of factors influencing RPSS (R^2) is 82%. When considering the total impact on RPSS in Thailand, SQ has the highest overall influence at 0.61, followed by OI at 0.52 and SM at 0.47, respectively.

Table 4: Mediation effects

Dependent Variables	R ²	Effect	Independent Variables		
			SQ	SM	OI
Service Quality (SQ)	0.56	DE			0.72**
		IE			-
		TE			0.72**
Service Motivation (SM)	0.78	DE	0.38**		0.53**
		IE	-		0.27**
		TE	0.38**		0.80**
Rail Passenger Service Satisfaction (RPSS)	0.82	DE	0.34**	0.47**	0.32**
		IE	0.27**	-	0.25**
		TE	0.61**	0.47**	0.52**

Note. **Sig. < .01

When considering the direct and indirect influences that affect passenger satisfaction with services in Thailand (RPSS), the motivation to use services (SM) has a significant influence with a size of 0.47 (Melan et al., 2021). The SQ has an influence size of 0.34, and the OI has an influence size of 0.32, statistically significant at the 0.01 level, respectively.

In addition, RPSS is also indirectly influenced by the SQ and OI, with influence sizes of 0.27 and 0.25, respectively, which are statistically significant at the 0.01 level. Similarly, Ariani (2023) in Indonesia revealed that SME (small-medium enterprise) job satisfaction is affected by the adopted OC, which is a crucial factor in improving employee performance, which thus leads to an improved OI. Similarly, in Indonesia, Achmad et al. (2023) also found that Generation Z workers' engagement and satisfaction successfully effect each worker's willingness to stay and develop, thus significantly contributing to an organization's image.

Additionally, as we can see from the hypotheses testing in Figure 2, OI in Hypothesis 1 directly and significantly influenced SQ ($r = 0.72, p \leq 0.01$). There was also a strong influence between OI and SM in Hypothesis 2 ($r = 0.53, p \leq 0.01$). These relationship strengths were followed next by SM's influence on RPSS in Hypothesis 6 ($r = 0.47, p \leq 0.01$).

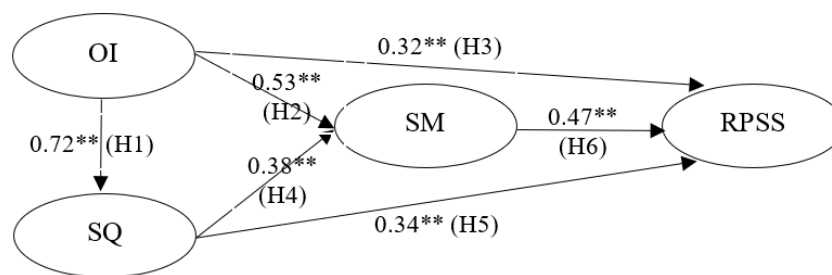


Fig. 2: Final SEM for RPSS

Note: Chi-Square=94.58, df=81, p -value=0.74521, RMSEA=0.000, **Sig. < .01

Source: The authors.

Table 5: Research hypotheses test results

Hypothesis Statements	Coef.	t-test	Results
H1: OI directly and positively affects SQ.	0.72	6.94**	Supported
H2: OI directly and positively affects SM.	0.53	5.42**	Supported
H3: OI directly and positively affects RPSS.	0.32	4.96**	Supported
H4: SQ directly and positively affects SM.	0.38	3.84**	Supported

H5: SQ directly and positively affects RPSS)	0.34	3.26**	Supported
H6: SM directly and positively affects RPSS.	0.47	6.62**	Supported

**Sig. < .01

The study found support from other studies regarding rail passenger service satisfaction and the importance of other constructs, including organizational image, service quality, and service motivation. These include research from Priyadharshini and Muthusamy (2016) in India, which found that SQ affects customer satisfaction in rail transportation. In the Czech Republic, Olivková (2015) examined 2,120 mass transit commuters' RPSS and SQ and determined that transit time (23%) and punctuality (21%) were most important to Czech commuters.

Furthermore, the finding that 35.36% of SRT rail passengers utilize the train at least ten times per week or more carries several potential implications. These include high dependence may indicate that the rail system is a primary mode of transportation for a substantial portion of the population, possibly due to convenience, cost-effectiveness, or reliability.

Frequent use of the rail service may imply that passengers find it efficient and reliable for their daily transportation needs. The SRT's ability to consistently meet the demands of high-frequency passengers suggests operational reliability, timely schedules, and service quality that aligns with commuter expectations.

High rider frequency may reflect economic considerations, as train travel can be a more cost-effective option compared to other modes of transportation. Additionally, frequent rail usage aligns with environmentally conscious commuting practices, contributing to reduced individual carbon footprints and supporting sustainable transportation.

The high frequency of rail usage may indicate the importance of the rail network in connecting urban areas. It suggests that the rail system effectively serves as a backbone for urban mobility, facilitating accessibility and connectivity within the city or between regions.

4.6. Unveiling Opportunities and Navigating Constraints in Rail Passenger Satisfaction

The study's primary objective is to illuminate the intricacies of rail passenger satisfaction within the SRT, it is crucial to recognize the constraints that accompany such a narrow focus. Limitations arise from the unique contextual factors, organizational dynamics, and cultural nuances that characterize the SRT rail systems. The findings, while invaluable for stakeholders directly associated with the SRT, may lack direct applicability to rail systems with disparate structures, operating environments, and customer demographics. Consequently, generalizing the study's findings beyond the SRT's specific context requires caution and consideration of the broader railway landscape.

To mitigate this limitation and enhance the generalizability of our findings, a multi-faceted approach is recommended. First and foremost, a comparative analysis with similar state-owned railway enterprises in the ASEAN region and globally can provide a broader perspective. By benchmarking against organizations facing analogous challenges and opportunities, stakeholders can extract insights that extend beyond the immediate purview of the SRT.

Additionally, collaborative research initiatives with international rail organizations can foster knowledge exchange and facilitate a more comprehensive understanding of global best practices. Engaging in cross-border collaborations enables stakeholders to discern patterns, trends, and effective strategies that transcend organizational boundaries, thereby enriching the generalizability of the study's outcomes.

5. Conclusion

The analysis substantiates the positive impact of service quality, organizational image and employee motivation on rail passenger satisfaction for Thailand's SRT. The findings empower strategic initiatives aimed at deficiencies around safety, train frequency, and staff demeanor to better meet traveler needs.

However, the exclusive SRT focus hinders generalizability. Future research must expand in scope while comparing efficiency metrics pre- and post-interventions to reveal tangible impacts on ridership and tourism. As Southeast Asia advances transportation infrastructure, maintaining traveler-centric quality will be imperative for both sustainability and global competitiveness.

6. Implications

The practical implications of these findings are far-reaching, providing valuable insights for informed management decisions in Thai rail service operations. Understanding the key drivers of passenger satisfaction empowers management to strategically implement targeted interventions aimed at enhancing efficiency, motivation, and service quality, thereby elevating overall passenger satisfaction. Successful implementation of these strategies not only positively influences the organizational image of the State Railway of Thailand (SRT) but also holds the potential to increase passenger ridership.

The study's insights shed light on the decision-making process of potential train passengers, offering relevant agencies and stakeholders the knowledge needed to formulate effective plans and policies for future passenger rail services. This research significantly contributes to the enhancement of Thailand's rail passenger services, fostering ongoing development and heightened customer satisfaction in the transportation sector.

However, it is imperative to acknowledge the study's limitations. The exclusive focus on SRT coaches and the omission of other rail commuter systems in Thailand, such as the Bangkok Transportation System (BTS/Skytrain) or Metropolitan Rail Transport (MRT/Subway), limit the generalizability of the findings. Future research endeavors should aim for a broader scope to provide a more comprehensive understanding of passenger satisfaction across diverse rail services in Thailand.

7. Implications for the State Railway of Thailand (SRT)

The SRT needs to consider the current and future capacity requirements to accommodate the needs of high-frequency passengers. Understanding peak usage times and popular routes can aid in optimizing schedules and deploying resources effectively.

The SRT should continue focusing on maintaining and improving service quality to meet the expectations of frequent passengers. This may involve addressing issues such as train punctuality, cleanliness, and amenities to enhance the overall commuter experience.

The SRT might explore pricing strategies or loyalty programs to incentivize and reward high-frequency passengers. Discounted monthly passes, loyalty points, or other incentives could encourage continued rail usage, fostering a sense of loyalty among frequent commuters.

The SRT may need to invest in infrastructure improvements, such as expanding platforms, increasing train frequency during peak hours, or enhancing station facilities, to handle the demands of a substantial number of daily passengers.

Understanding the demographics and preferences of high-frequency passengers can guide targeted marketing efforts. Conducting surveys and collecting feedback can provide valuable insights into the specific needs and expectations of this segment of the commuter population.

In conclusion, the high rider frequency among SRT rail passengers signifies a robust reliance on the rail system for daily commuting. Addressing the implications of this finding involves strategic planning, service optimization, and a commitment to meeting the diverse needs of this significant commuter segment.

8. Recommendations

Concrete recommendations for stakeholders emerge from the significant influences identified within the study. The intricate interplay between organizational image, service quality, and passenger satisfaction necessitates strategic interventions that address both immediate concerns and long-term sustainability.

Based on our findings, the following recommendations are proposed:

- Investment in Technological Integration: Embrace emerging technologies such as blockchain and the Internet of Things (IoT) to enhance service quality, streamline operations, and elevate the overall passenger experience.
- Cultivation of Organizational Image: Prioritize transparent communication, especially in the age of digital connectivity. Effective communication builds trust and enhances the organizational image, directly impacting passenger satisfaction.
- Continuous Service Quality Improvement: Regularly assess and improve observable attributes, consistency, and timeliness of services. Implement robust quality management systems to ensure a consistent and reliable passenger experience.
- Customer-Centric Approach: Tailor services to meet the evolving needs and expectations of passengers. Leverage customer feedback mechanisms to drive continuous improvement initiatives.
- Cross-Border Collaboration: Engage in knowledge-sharing partnerships with global rail organizations. This collaborative approach can facilitate the exchange of best practices and innovative solutions, contributing to the advancement of rail systems internationally.

In advancing the measurement of Rail Passenger Service Satisfaction (RPSS) and Service Quality (SQ), various methods are available. The European Standard of Service (European Standard EN 15140 2006), the RAILQUAL model drawing on aspects of the SERQUAL Model (Hartono et al., 2022), and the international benchmarking method developed for bus operations' customer satisfaction surveys, suggested by Trompet et al. (2013) and initiated by the International Bus Benchmarking Group, offer viable avenues for diverse transportation systems. Future studies may benefit from incorporating these methods to enrich the assessment and comparison of passenger satisfaction across different rail services.

In conclusion, while the study's focus on the SRT rail systems inherently introduces limitations, a strategic and collaborative approach can mitigate these constraints. By comparing, contrasting, and sharing insights globally, stakeholders can extract valuable lessons, fostering a more holistic understanding of rail passenger satisfaction that extends beyond organizational borders. Through thoughtful consideration of these recommendations, the rail industry can embark on a transformative journey toward enhanced service quality, customer satisfaction, and sustainable growth.

Acknowledgements

The authors would like to thank Ajarn Charlie for his invaluable contribution in editing and proofreading this paper.

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