Service Quality Assessment of Mass Public Transit Related to Passenger Satisfaction: A Case Study of Nonthaburi

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Abstract

Establishing the service quality factor in enhancing and improving passenger satisfaction is fundamental in public transit development. The objective of this study was to assess the influence of quality of service, comprising five factors: tangibility, reliability, receptivity, assurance, and empathy, on passenger satisfaction of bus rout 1 6 6 of Nonthaburi. The data were collected through a questionnaire. The data set was empirically analyzed using a survey of 473 respondents regarding their perceptions of the service provided of bus route 166 of the mass transit authority. The study conducted multiple regression analysis. The results showed that service quality affects passenger satisfaction by 3 factors: empathy, tangibility, and reliability have a positive impact on passenger satisfaction, respectively. Hence, this study also provides further insights into public transit value-added services. The research shows that employee empathy is the most important factor in promoting passenger satisfaction. The organization should encourage the selection and training of employees to be attentive to service and to perform their duties appropriately. Tangibility improvements by improving the condition of the bus in terms of cleanliness and appearance. Improving reliability by allocate the amount of vehicles sufficiently and consistently schedule.

Keywords: Service Quality, Passenger Satisfaction, Public Transport, Multiple Regression, Nonthaburi

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Introduction

Public transit in developing nations has increased substantially due to environmental protection and global warming issues (Bigne et al., 2003). In Thailand, traffic problems bring about environmental issues and affect the population's living quality. Therefore, the promotion of public transport is a stated policy goal of the Thailand government agency. The transportation strategy expresses the desire to encourage passengers to turns to public transit by providing a high-quality service to improve public transit usage. Increasing public transport holds the potential utility for the community because it is an economic and environmental promotion.

According to non-profit organization. Public organizations are less concerned with market competition than private organizations. As a result, public organizations are less efficient in terms of the properties and employees' unavailability compared to non-government organizations (Andreassen, 1994). Additionally, public managers are often not rewarded for efficiency and lack the autonomy required by the private sector. Brysland and Curry (2001) noted that there is little incentive to enhance service quality because public organizations do not need to compete in the market like private organizations, resulting in public organizations invisible to the need for a customer service focus on their agencies (Gowan et al., 2001).

An essential aspect of public organization management is the growing awareness of the government's emphasis on delivering good service quality. Creating a quality of service that is superior to competitors has a positive effect on customer satisfaction and interest in service, causing the development of service quality to create a competitive advantage for the organization (Tam, 1999). Service quality research focuses on analyzing variables that affect customer behavior and creating marketing strategies to attract customers. (Boulding et al., 1993; Friman et al., 2001; Friman and Garling, 2001)

Promoting public transit is research that has compiled attention from the private and public sectors (Graham-Rowe et al., 2011). Improving the service quality of public transport is a strategy used to attract passengers to the increased use of public transport (Currie and Wallis, 2008). The study used a questionnaire to measure attitudes towards the service quality of public transport by questioning passengers. Based on the relevant literature review, the service quality factors, including tangibility, reliability, receptivity, assurance, and empathy, were established and the hypothesis and analysis of the impact of service quality factors on the satisfaction of public transport passenger.

Traffic problems cause pollution from greenhouse gases and noise. Glasshouse gas has a huge impact on the environment. International interest in greenhouse gas control, which has contributed to the Thai government's involvement in greenhouse gas reductions. Thailand faces traffic problems, especially Bangkok and its vicinities. The government therefore wants to promote the use of public transport to reduce traffic congestion. Chaeng Watthana Road in Nonthaburi Province is always a traffic jam due to the presence of government agencies. However, Nonthaburi has public transport services. Bus route 166 is an important bus because it is a bus service from Pak Kret District to Victory Monument, which has a large number of users.

Promoting the use of public transport will help to reduce traffic congestion, especially bus lines that are in constant use. The objective of this research was to promote the use of public transport by increasing passenger satisfaction, with a sample group of bus route 166 users.

Research objective

The objective of this study was to assess the influence of quality of service, comprising five factors: tangibility, reliability, receptivity, assurance, and empathy, on passenger satisfaction of bus route 166 of Nonthaburi.

Literature review

Service quality

The research stream focuses on the impact of service quality on consumer behavior. The research focused on the relationship between service quality and improvements in organization productivity (Zahorik & Rust, 1992). Boulding et al. (1993) and Liu et al. (2000) have studied the origins of consumer loyalty and its impact on the profits of the service sector. These studies support the argument that improvements in service quality have a positive influence on intention to use. However, it also shows that a superior level of service quality should be achieved (Zeithaml et al., 1996).

According to, Lewis & Booms (1983) and Parasuraman et al. (1988) defined service quality as an attitude or decision that is related to expectations as measured by the delivery of service that meets the expectations of the consumer. In quality assessment, which makes the concept of service quality complex and abstract, service quality must be assessed through the factors demonstrating the quality of service and can be compared with that. received and the expectations of the service users. (Zeithaml, 1988; Parasuraman et al., 1985). Attitude measurement is therefore linked to the quality of service. Attitude factors are widely used in the quality of service studies. However, there are many dimensions of attitude factors that need to be studied continuously (Olshavsky, 1985; Bitner & Hubbert, 1994)

Perceived service quality was defined as an importance factor in describing passenger satisfaction in public transport (Cronin et al., 2000). Due to the diversity of attitude factors used in the quality of service research that are associated with passenger satisfaction, the study of differences between usage contexts and differentiation factors remains unchanged. It is important to study the quality of service. (Anderson & Sullivan, 1993; Gotlieb et al., 1994; Patterson & Spreng, 1997; Roest & Pieters, 1997; Taylor, 1997; Taylor & Baker, 1994; Zeithaml et al., 1996).

Parasuraman et al. (1988) established five latent variables to measure service quality:

- Tangibility is a variable that emphasizes the tangible elements in the service process such as the condition of the place of service, equipment, tools, including the appearance and clothing of the customers wearing the service.

- Reliability is a variable that emphasizes the feelings of passengers in terms of the clarity of the information provided by the service provider. Information that passengers can use to evaluate and compare services and travel planning.

- Receptivity is a variable that emphasizes the accuracy and speed of the service process that employees provide to passengers.

- Assurance is a variable that focuses on creating a sense of safety in use and answering questions of passengers.

- Empathy is a variable that focuses on employee attention to customer service and facilities.

Passenger satisfaction is the feeling of a passenger who has received service and is compared to expectations and actual services. This research used quality of service to assess which dimensions of service quality affect passenger satisfaction.

Service quality is a comparison between customer service expectation and customer perception of the service actually received. This study was developed from the SERVQUAL scale (Parasuraman et al., 1988), which defines 21 five dimensions of service quality. The hypothesizes of this study are as follow:

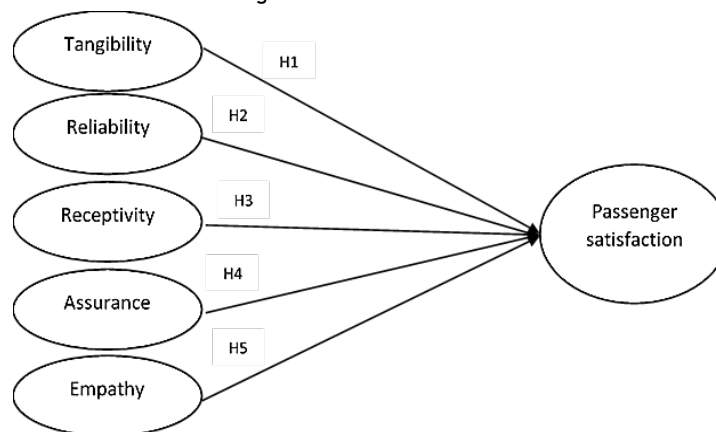H_1: Tangibility has a positive impact on passenger satisfaction

H_2: Reliability has a positive impact on passenger satisfaction

H_3: Receptivity has a positive impact on passenger satisfaction

H_4: Assurance has a positive impact on passenger satisfaction

H_5: Empathy has a positive impact on passenger satisfaction

Figure 1. Research framework

Research methodology

    Population and sample

       The population required in this study were passengers of the bus route 166. This study used convenient sampling to test the correlation of variables. According to Park & Sullivan (2009) convenient sampling can be performed in research to test the correlation of variables.

       Collect data using surveys with a total of 473 samples were bus route 166 passengers in Nonthaburi, Thailand. The respondents were 18 years old and older. A simple random sampling technique was used; data were collected at different times of the day and on different days of the week. Data were collected via the self-administered questionnaire between October - December 2020 at Nonthaburi. The majority of respondents were female (76.7%) in terms of respondents' age. Most of the respondents were aged 21-30 (77.8%), and most respondents were students (95.8%).

Table 1 The profile of the respondent (N= 473)

Characteristic	Category	Number	%
Gender	Male	110	23.3
	Female	363	76.7
Age	18-20	98	20.7
	21-30	368	77.8
	31-40	6	1.3
	41-50	1	2.0
	More than 50	0	0
Education	Senior high school	12	2.6
	Bachelor	453	95.8
	Higher education	8	1.7
Occupation	Government employee	2	0.4
	Private employee	16	3.4
	Entrepreneur	1	2.0
	Student	453	95.8
	Unemployed	1	2.0
Monthly income	Less 10,000 THB	338	61.7
	10,000-20,000 THB	122	12.3
	20,001-30,000 THB	8	12.7
	More than 30,000 THB	5	13.3

Research tools

The objective of this research was to study the impact of service quality on passenger satisfaction. This research involved six latent variables: tangibility, reliability, receptivity, assurance, empathy, and passenger satisfaction. Diamantopoulos et al. (2012) argued that latent variables should be measured using multiple items. Therefore, as recommended by Buil et al. (2012), several entries were obtained from the relevant literature to ensure the validity of the content of the research variables. The research tool uses a five-point Likert scale from "Strongly disagree (1)" to "Strongly agree (5).

Table 2 List of latent variables and observed variables

Latent variable	Symbol	Observed variable	Code
Tangibility	TG	The buses are in good condition.	TG1
		Buses have attractive operations.	TG2
		Employees are of a professional nature.	TG3
		Service-related facilities are in good condition.	TG4
Reliability	RL	The bus provides complete information about the service.	RL1
		The buses provide good information about the service.	RL2
		Employees have the ability to deal with customer problems.	RL3
		Provides service as promised	RL4
Receptivity	RC	Staffs have fast service	RC1
		Customers get comfortable with services	RC2
		Buses meet the needs of customers	RC3
Assurance	AS	Employee behavior makes customers feel trusted.	AS1
		Employee behavior makes customers feel safe.	AS2
		The staffs are courteous.	AS3
Empathy	EM	Employees are knowledgeable in answering customer questions.	EM1
		Buses have schedules that are convenient for customers.	EM2
		Buses have routes that are convenient for customers.	EM3
		The buses have frequencies that are convenient for customers.	EM4
		Employees are attentive to customers.	EM5
		Employees are sincere in their service.	EM6
		Employees understand the needs of customers.	EM7

Latent variable	Symbol	Observed variable	Code
Satisfaction	ST	You like the feeling of using the bus.	ST1
		You feel that the use of the bus is suitable for the lifestyle.	ST2
		You are satisfied with the overall use of the bus.	ST3
		You will continue to use the buses in the future.	ST4

Table 3 Overview of service quality and passenger satisfaction by the public transportation passengers

Symbol	Variable	minimum	Maximum	Mean	S.D.
TG	tangibility	1	5	3.75	0.79
RL	reliability	1	5	3.73	0.82
RC	receptivity	1	5	3.70	0.79
AS	assurance	1	5	3.74	0.79
EM	Empathy	1	5	3.71	0.79
ST	satisfaction	1	5	3.80	0.76

Research tool development

The research questionnaire was developed to measure reliability to test the construct validity and reliability of the questionnaire. Two criteria were used to assess the validity of the structure: Kaiser Meyer Olkin value $\geqslant$0.5; p-value of Bartlett test of sphericity $\leqslant$0.05 (Hair et al., 2006; Lai and Chen, 2011). that all variables meet the structural validity criteria. The reliability of the variables was assessed based on the Cronbach coefficient α using the recommended exceeded value of 0.6 (Hair et al., 2006; Lai & Chen, 2011).

Statistical techniques

Data analysis was performed using multiple regression, a statistical analysis tool that the study use (Hair et al., 2006) to endorse those respondents are public transit passengers. The multiple-regression technique is a common method used by practitioners in marketing research. Multiple-regression analyses were performed to test simultaneous effects and partial effects of five independent variables on one dependent variable (Hair et al., 2006).

Results and Discussion

Results

The result of construct validity and reliability were confirmed that variables can be used to analyzed (KMO value $\geqslant$0.5; p-value of Bartlett test of sphericity $\leqslant$0.05, Cronbach coefficient $\alpha \geqslant$ 0.6). The result can be

seen in Table 4. Base on Table 5, Pearson's correlation is not more than 0.8, which indicates that the variables do not overlap and can be used for analysis. Data was analyzed using multiple regression. The results of the multiple regression analysis can be seen in the table. The p-value of the F statistic is 0.000 below 0.05, which means it can be used to predict public transport passenger satisfaction.

Base on Table 6, the first findings of this research show that tangibility has a positive and significant effect on passenger satisfaction (B = 0.140, p-value = 0.007). Therefore, H1 is supported. Second, this study found that the non-standard B coefficient of reliability was positive (B = 0.122), and the p-value was less than 0.05 (p-value = 0.044), meaning that reliability affected passengers' satisfaction positively and significant direction H2 is catered for. Third, it was founded that compassion significantly impacted passenger satisfaction (B = 0.452, p-value = 0.000), so H5 was supported.

The fourth finding of this study showed that exposure and confidence does not significantly affect passenger satisfaction, with the B and p-value equal to (B = 0.069, p-value = 0.242) and (B = 0.070, p-value = 0.257) respectively. Thus, rendering hypotheses H3 and H4 are not supported.

Table 4 Result of Construct validity and reliability

Variable	KMO	Bartlett's test of sphericity (sig.)	Cronbach coefficient α
Tangibility	.811	.000	.876
Reliability	.853	.000	.901
Receptivity	.744	.000	.890
Assurance	.837	.000	.911
Empathy	.924	.000	.933
Satisfaction	.840	.000	.903

Table 5 The result of Pearson correlation

Variable	TG	RL	RC	AS	EM	ST
TG	1					
RL	.750	1				
RC	.709	.774	1			
AS	.707	.731	.764	1		
EM	.691	.738	.752	.779	1	
ST	.736	.661	.658	.664	.709	1

Table 6 The result of regression model

Hypothesis	Estimate	Sig	Result
TG ➜ ST	.140	.007	Supported
RL ➜ ST	.122	.044	Supported
RC ➜ ST	.069	.242	Not supported
AS ➜ ST	.070	.257	Not supported
EM ➜ ST	.452	.000	Supported

Discussion

The results showed that service quality affects passenger satisfaction by 3 factors: empathy, tangibility, and reliability have a positive impact on passenger satisfaction, respectively. Empathy is the most influential factor in passenger satisfaction. Improving empathy will allow more passengers to turn to bus services. Increasing empathy can be achieved through the importance of selecting employees who are service-minded and understand their responsibilities. In addition, staff must be trained to be able to answer questions and provide accurate information that passengers need. Having a clear schedule and information will help facilitate passengers and staff. Service providers therefore need to have a clear operating plan and have media used in public relations that reach passengers.

Tangibility plays an important role in increasing passenger satisfaction. Passenger satisfaction is a comparison of the feeling expected from management to what is actually received, showing that there is a marked difference between what is tangibility. The service provider can improve in a number of ways, such as improving the condition of the buses to be modern and clean, improve the bus stop to be modern and clean. There are signs posted to provide travel information and contact numbers for staff in case of any questions. Determining appropriate dress rules for employees.

Reliability is what service providers gain when they are able to provide clear and consistent service. It involves providing information and providing services that meet the information provided, where credibility plays an important role in the service industry. Clear functionality allows passengers to accurately assess what's being offered and to create peace of mind in their service as they don't have to worry about anything going beyond their expectation.

Improvement of the quality of service must be made continually. To maintain the quality of service, it is important to focus on employees as they are the ones who directly interact with customers. Service providers therefore have to pay attention to the selection. Train and retain talented employees because the quality of service goes with each employee.

Contributions

Theoretical implementation

Public transport passenger satisfaction is a key factor for the management of public transport operators. Due to the declining use of public transport and the increasing use of private cars (Sumaedi et al., 2012), Public transport providers have to realize the factors influencing passenger satisfaction. This study focuses on evaluating passenger satisfaction. This paper fills a gap in the literature by developing and evaluating a public transport passenger satisfaction model.

This research shows that public transit passenger satisfaction is influenced by tangibility, reliability, and empathy. At the same time, receptivity and assurance do not affect the satisfaction of public transport passengers. The insignificant effect of receptivity and assurance on public transport passenger satisfaction may be due to the limited alternative of the passenger in public transportation services. The variables used in the research can be used in relevant research. Moreover, variables in passenger satisfaction research can also add variables more than this study.

Managerial implementation

The findings provide management implications for public transport providers to establish passenger satisfaction. First, the results show that public transport providers should manage tangibility, reliability, and empathy. Second, the providers should focus on marketing and operational strategies to improve passenger tangibility, reliability, and empathy for public transport services.

Secondly, Public transport providers can also categorize passengers based on tangibility, reliability, and empathy. The classification can be used as information in passenger targeting for public transport providers. Third, our findings are also important to governments. Governments can develop a public transport efficiency index by using the variables of this study. Governments can use this index to examine the efficiency of public transport services and decide whether government intervention is necessary. The research shows that employee empathy is the most important factor in promoting passenger satisfaction. The organization should encourage the selection and training of employees to be attentive to service and to perform their duties appropriately. Tangibility improvements by improving the condition of the bus in terms of cleanliness and appearance. Improving reliability by allocate the amount of vehicles sufficiently and consistently schedule.

Conclusion

This research has tested the effect of different elements in service quality on passenger satisfaction. This study found that passengers' satisfaction was heavily influenced by tangibility, reliability, and empathy. Developing policies to promote the use of public transport must rely on research knowledge to come up with policies that meet passenger needs. Tangible is an important aspect of the development of public transport as it is the first thing that passengers will encounter and make an impression before they are served. The quality of service is

assessed on two factors: reliability and empathy. Reliability is a matter of being on time and having a service that meets passengers' expectations and empathy is up to the employee to show the passenger.

According to the results of passenger satisfaction studies, there are many reasons. Tangible things that are part of the station and the condition of the bus. Credibility is part of the service process and compassion is part of the employee. Increasing passenger satisfaction requires taking into account several elements and developing in parallel with all of them for a successful operation. Increased use of public transport will help to reduce pollution caused by traffic congestion and help to reduce greenhouse gas and oil consumption. International cooperation is essential in addressing environmental issues as environmental issues affect the people of the world.

Limitations and Future Research Directions

This research produces some interesting findings; however, there are limitations to be noted. First, this study used convenient sampling and also carry out data collection only in Nonthaburi, Thailand. Therefore, the results should not be applied in other contexts. Secondly, this study included only the variable from service quality as a predictor of passenger satisfaction. The R2 was 68.4 percent, so we estimate that other variables remain that precede public transport passengers' satisfaction. Given the limitations, the researcher recommends incorporating other variables in the research model and providing public transport passengers from other areas related to test the model in future research.

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