SELECTED SERVICE QUALITY FACTORS THAT INFLUENCE THE SATISFACTION OF PUBLIC LAND TRANSPORT USERS IN BANGKOK

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ABSTRACT

Traffic congestion has always been one of the biggest problems in Bangkok. The rapid increase of personal vehicles each year has contributed to heavy congestion, resulting in heavy air pollution. Public transport service providers need a better understanding of their users' expectations by analyzing and assessing service quality and performance feedback and ratings. The correlation between service quality and user satisfaction of five service quality factors (tangibility, reliability, responsiveness, assurance, and empathy) and two factors of perceived value (price and time) was studied.

The results showed that all variables were positively correlated with the satisfaction of public transportation users. The factors of responsiveness and perceived value of time significantly influenced the satisfaction of BTS Skytrain users, while assurance influenced the satisfaction of MRT Subway users. Tangibility and the perceived value of time influenced the satisfaction of fan bus users, while responsiveness and perceived value of time influenced the satisfaction of air-conditioned bus users.

Keywords: service quality, perceived value, satisfaction of public transportation users.

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INTRODUCTION

People in Bangkok are facing a high intensity of traffic congestion each day. Traffic congestion is one of the root causes contributing to an increased level of air pollution. While the number of cars keeps rising (Transport Statistics Planning Division of Department of Land Transport, Online, 2020), the number of old cars being retired is low. With high traffic congestion on the road each day, public transportation is one option that can enable reducing the use of personal vehicles and lower the traffic congestion rate.

Irfan (2016) stated that customer satisfaction is important to the relationship between service quality and customer loyalty. Customer loyalty plays a significant role in businesses. Su, Schmöcker and Bell (2009) stated that requirements for public transportation systems vary, with reliability and efficiency as key factors, and service operating hours and network infrastructure often extended to serve needs better.

RESEARCH OBJECTIVES

1. To study the level of service quality (SERVQUAL), perceived value, and satisfaction of the BTS Skytrain, MRT subway, and fan and air-conditioned bus service users.

2. To study the correlation between service quality and perceived value on the satisfaction of BTS Skytrain, MRT subway, and fan and air-conditioned bus service users.

3. To study the factors of service quality and perceived value that influence satisfaction of BTS Skytrain, MRT subway, and fan and air-conditioned bus service users.

CONCEPTS AND THEORIES

Measuring the service quality in a business service, Parasuraman, Zeithaml and Berry (1985) developed SERVQUAL as a tool to evaluate the perception of users toward service quality, as well as for its improvement in the business. This multi-dimensional model categorizes service quality into five factors, which consist of tangibility, reliability, responsiveness, assurance, and empathy.

Customers want to pay a reasonable price for any service or product, and do not wish to overpay. Varki and Colgate (2001) stated that price perception has a significant impact on consumer satisfaction. Pricing predefines the service expectation and performance outcome that become the basis for sales and consumer loyalty. Value of time usually refers to the cost of the time that a passenger spends on a trip, and so the benefit is based on the amount that a passenger is willing to pay to save time (Wardman, 2004). Each person defines the value of time differently based on their perception of time.

CONCEPTUAL FRAMEWORK

A conceptual framework showing the proposed relationship between the SERVQUAL variables, perceived value of time and price, and customer satisfaction is shown below.

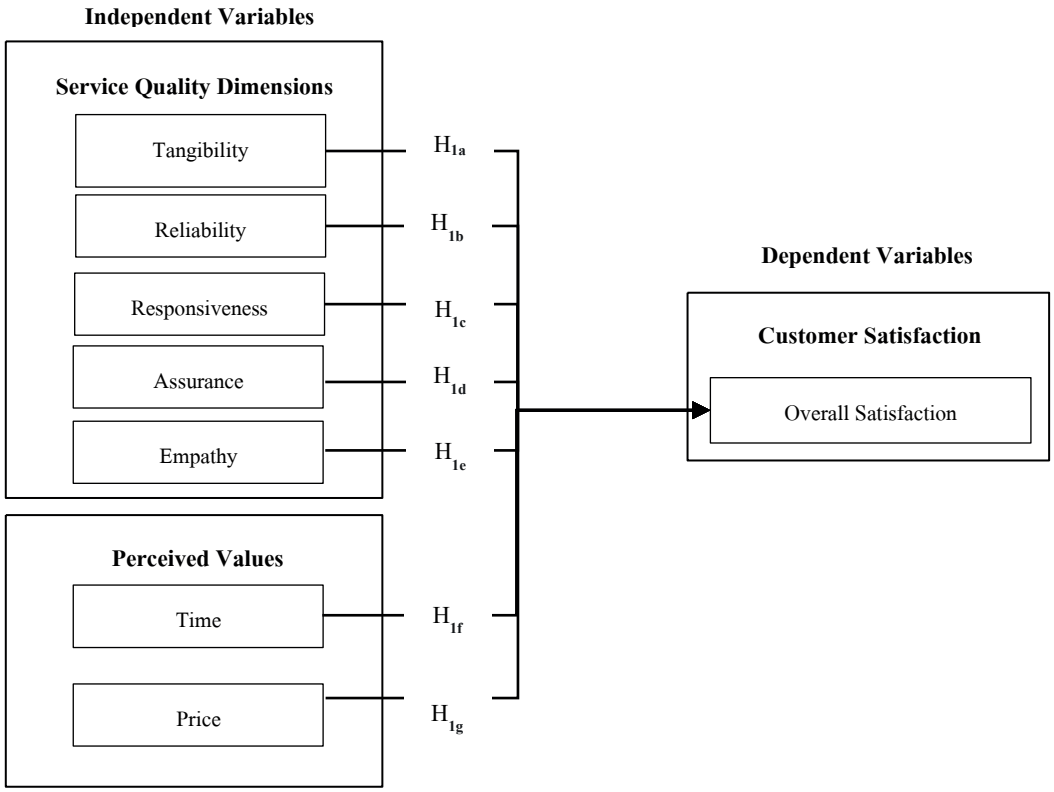

Figure 1. Conceptual Framework Showing Key Variables

RESEARCH METHODOLOGY

Population and Sampling Frame

By using a quota sampling method total of 400, the overall sample was divided into 100 BTS Skytrain users, 100 MRT Subway users, 100 BMTA fan bus passengers, and 100 BMTA air-conditioned bus commuters.

Research Instrument

Questionnaire

The questionnaire was developed by the researcher, and questions

were divided into four main categories: 1) demographic data and service usage behavior, 2) level of service quality, 3) level of user perceived value, and 4) user satisfaction. The questionnaire's validity was assessed and verified by five experts with an Item-Objective Congruence score of 0.87. The questionnaire was also tested in a pilot study with 40 respondents.

Rating Scale

The scoring of the variables in the research instrument was according to a Likert scale that divided the range of opinions into five levels. Each range of opinion level was interpreted by finding the average scores.

Range = (highest score – lowest score)/level of range = (5-1)/5 = 0.80

Interpretation of the Five Levels of Agreement/Satisfaction

An average score of 4.21-5.00 meant that respondents Strongly Agree/ Very Satisfied

An average score of 3.41-4.20 meant that respondents Agree/Satisfied

An average score of 2.61-3.40 meant that respondents were Neutral

An average score of 1.81-2.60 meant that respondents Disagree/Dissatisfied

An average score of 1.00-1.80 meant that respondents Strongly Disagree/ Strongly Dissatisfied

Analysis

The descriptive analysis helped depict and describe the general characteristics of the sample group. Mean ($\bar{x}$) and Standard Deviation (*SD*) were used for describing the independent and dependent variables. Pearson's correlation coefficient was used to analyze the relationship between two variables (bivariate) measured at intervals or ratios, where the relationship between the data was linear. Multiple regression equations are used to study independent variables that have influence or are used to predict dependent variables. Stepwise Multiple Regression was used to indicate the influence of service quality dimensions and the perceived values of price and time on the satisfaction of public transportation users.

FINDINGS

Demographic and Public Transportation Usage Behavior

Most respondents were female (*N*=261, 65.00%), with 161 between 20 to 29 years old (40.00%). Most respondents were private sector employees or students (*N*= 321, 80.00%), and 196 respondents (49.00%) had monthly incomes of 15,000 Baht or below. Of these, 326 respondents used public transportation 3 times or less (31.00%), with the largest number (*N*=344) traveling between 9:01 AM and 4:00 PM (36.00%).

Descriptive Statistics

Table 1 shows the mean scores for service quality for the rail transport systems – the BTS Skytrain and MRT Subway – were 3.48 and 3.54 out of 5.00 respectively. The BMTA bus services – the fan buses and air-conditioned buses – received scores of 2.46 and 3.14 respectively.

Table 1. Perceived Levels of Service Quality Factors for Public Transport Systems

Service Factor	BTS Skytrain	MRT Subway	Fan Buses	Air-Conditioned Buses
Tangibility	3.42	3.59	2.06	3.01
Reliability	3.48	3.48	2.56	3.23
Responsiveness	3.36	3.48	2.49	3.01
Assurance	3.71	3.53	2.89	3.30
Empathy	3.51	3.55	2.70	3.26
Average	3.48	3.54	2.46	3.14

Both the MRT Subway and BMTA air-conditioned bus users rated the perceived value of these services at 3.21 out of 5.00, as shown in Table 2. BTS Skytrain received a perceived value rating of 3.15, and the BMTA fan bus rating was 2.60.

Table 2. Levels of Perceived Value for Public Transport Systems

Service Factor	BTS Skytrain	MRT Subway	Fan Buses	Air-Conditioned Buses
Price	2.96	3.01	2.65	3.24
Time	3.48	3.54	2.51	3.15
Average	3.15	3.21	2.60	3.21

In Table 3, both the BTS Skytrain and MRT Subway users seemed satisfied with the quality of service, and received mean scores of 3.47 and 3.50 respectively. Users were neutral toward the BMTA air-conditioned buses with a mean score of 3.36, and were dissatisfied with the BMTA fan buses, with a mean score of 2.51.

Table 3. Satisfaction Levels with Public Transport Systems

Satisfaction	BTS Skytrain	MRT Subway	Fan Buses	Air-Conditioned Buses
Overall Average	3.47	3.50	2.51	3.36

Factors Correlated with Satisfaction of Bangkok Public Transportation Users

BTS Skytrain Service

According to the research findings, factors of responsiveness, empathy, time, assurance, tangibility, and reliability were correlated at a medium level with the satisfaction of BTS Skytrain users at the .01 level (r = .659, r = 643, r = .607, r =.589, r = .565, r =.502 respectively). Only the factor of price was correlated at a low level (p< .01, r = .412), which indicated that BTS commuters were not too concerned about the current level of ticket prices.

MRT Subway Service

The service quality factors of assurance, responsiveness, empathy, reliability, and tangibility had a medium level of correlation to the satisfaction of the MRT Subway users at the .01 (r = .688, r = .618, r = .606, r = .555,

r = .525 respectively). The perceived value factors of time and price had a low level of correlation (*p*< .01: *r* = .406, *r* = .329 respectively), which implied that train schedules and ticket prices were not adversely affecting the satisfaction of subway commuters.

BMTA Fan Bus Service

The factors of time, tangibility, price, empathy, and responsiveness were correlated at the .01 level with the satisfaction of BMTA fan bus users at a medium level (*r* = .594, *r* = .578, *r* = .573, *r* = .508, *r* = .506 respectively). The factors with a low level of correlation with satisfaction were reliability and assurance (*p*< .01: *r* = .461, *r* = .392 respectively). This suggested that fan bus passengers were not too concerned about service quality related to these factors.

BMTA Air-Conditioned Bus Service

The factors that were correlated (*p* = .01) to user satisfaction of BMTA air-conditioned bus service at a medium level were responsiveness, assurance, empathy, reliability, price, and time (*r* = .635, *r* = .570, *r* = .565, *r* = .550, *r* = .526, *r* = .522 respectively). The factor of tangibility had a low level of correlation with the BMTA air-conditioned bus service users (*r* = .364), which indicated that the condition of the buses was not a major factor affecting commuter satisfaction.

Factors that Influenced the Satisfaction of BTS Skytrain Users

Table 4 shows the results of stepwise multiple regression to predict which factors influenced the satisfaction of BTS Skytrain users.

Table 4. Stepwise Regression of Factors Predicting BTS Skytrain User Satisfaction (N = 100)

Model	Independent Variables	R^2	F	Coefficients Regression			t
				b	SE	β	
1	Responsiveness	.435	75.375***	3.334	.384	.659	8.682***
2	Responsiveness	.435	60.086***	2.440	.386	.483	6.327***
	Value of Time	.119		2.612	.515	.387	5.075***
BTS Skytrain User Satisfaction = 19.708, R^2 = .553, F = 60.086, p < .001							

*p<.05, **p<.01, ***p<.001

The service quality factor of responsiveness refers to the ability of service personnel to help and respond to user queries, and it accounted for 43.50 percent of Skytrain user satisfaction. By adding the perceived value of time, which includes waiting for the train to arrive and overall travel time to user destinations, this increased to 55.30 percent at a statistically significant level (p<.001).

Factors that Influenced the Satisfaction of MRT Subway Users

Table 5 shows the results of stepwise multiple regression analysis to predict the satisfaction of MRT Subway users.

Table 5. Stepwise Regression of Factor Predicting MRT Subway User Satisfaction (N = 100)

Model	Independent Variables	R^2	F	Coefficients Regression			t
				b	SE	β	
1	Assurance	.473	87.894***	3.737	.399	.688	9.375***
MRT Subway User Satisfaction = 24.594, R^2 = .473, F = 87.894, p<.001							

*p<.05, **p<.01, ***p<.001

The service quality factor of assurance refers to credibility of the service to deliver an expected experience for users, and it accounted for 47.3 percent of user satisfaction at a statistically significant level of .001.

Factors that Influenced the Satisfaction of BMTA Fan Bus Users

Table 6 displays the results of stepwise multiple regression and the independent variables that predicted the satisfaction of fan bus users.

Table 6. Stepwise Regression of Factors Predicting BMTA Fan Bus User Satisfaction (N = 100)

Model	Independent Variables	R^2	F	Coefficients Regression			t
				b	SE	β	
1	Value of Time	.352	53.317***	4.355	.596	.594	7.302***
2	Value of Time	.352	35.952***	2.810	.715	.383	3.930***
	Tangibility	.073		1.315	.373	.343	3.520***
Fan Bus User Satisfaction = 14.885, R^2 = .426, F = 35.952, p<.001							

*p<.05, **p<.01, ***p<.001

The perceived value of time is how users rated the importance of the overall time spent on service, which predicted 35.20 percent of the variance in fan bus user satisfaction. When the service quality factor of tangibility, or the appearance and condition of buses was added, this level increased to 42.70 percent at a statistically significant level (p<.001).

Factors that Influenced the Satisfaction of BMTA Air-Conditioned Bus Users

Table 7 shows the results of stepwise multiple regression analysis and the available factors for predicting the satisfaction of the air-conditioned bus users.

Table 7. Factors Predicting BMTA Air-conditioned Bus User Satisfaction (N = 100)

Model	Independent Variables	R^2	F	Coefficients Regression			t
				b	SE	β	
1	Responsiveness	.403	66.085***	3.625	.446	.635	8.129***
2	Responsiveness	.403	37.841***	2.856	.534	.500	5.347***
	Value of Time	.036		1.453	.587	.232	2.477**
Air-conditioned Bus User Satisfaction = 29.259, R^2 = .438, F = 37.841, p<.001							

*p<.05, **p<.01, ***p<.001

The service quality factor of responsiveness, which is the personnel service support of air-conditioned bus, predicted 40.30 percent of user satisfaction; by adding the perceived value of time, or waiting time plus traveling time, this increased to 43.9. percent at a statistically significant level of .001.

Comparison of Railway and Bus Services

A t test (Table 8) revealed that the BTS Skytrain service quality factor of tangibility was different from that of the MRT Subway service at the .01 level of significance.

Table 8. t test Comparison of Railway and Bus Service

Variables	BTS	MRT	t	Fan Bus	AC Bus	t
Service Quality						
- Tangibility	3.42	3.59	12.20**	2.06	3.01	8.82**
- Reliability	3.48	3.48	.000	2.56	3.23	5.83**
- Responsiveness	3.36	3.48	1.03	2.49	3.01	4.08**
- Assurance	3.71	3.53	.24	2.89	3.30	3.21*
- Empathy	3.51	3.55	.29	2.70	3.26	4.05**

Table 8. (continued)

Variables	BTS	MRT	*t*	Fan Bus	AC Bus	*t*
Perceived Value						
- Price	2.96	3.01	.38	2.65	3.24	4.19**
- Time	3.48	3.54	.53	2.51	3.15	4.59**
Satisfaction	3.47	3.50	.26	2.51	3.36	6.72**

*$p<.05$, **$p<.01$

All service quality factors and perceived value factors of fan bus service were different from the air-conditioned bus service at .01 level of significance except for assurance, which was significant at the .05 level.

DISCUSSION

Factors that Influenced Satisfaction of BTS Skytrain Service Users

The service quality factor of responsiveness and the perceived value of time in combination may predict the satisfaction of BTS Skytrain users. When staff members help disabled users, this reflects good service quality and interpersonal relationships, making users feel genuinely touched and satisfied with the service provided.

According to Panchareon and Phisitkasem's study (Panchareon & Phisitkasem, 2018), responsiveness to customer needs affected the satisfaction of BTS Skytrain users. This includes minimal time spent waiting for the next train's arrival, service staff actively serving users, and fast-working automatic ticket selling machines. The study found that user responses were based on staff members' knowledge and readiness to provide information to customers, along with their ability to answer customer inquiries and give them advice.

Factors that Influenced Satisfaction of MRT Subway Service Users

The factor of assurance predicted the satisfaction of MRT Subway users. Examples included ticket sellers advising customers, answering their

questions correctly, being quick to serve, and calculating fares accurately. If the subway service system improves the assurance factor, this would increase users' confidence and might lead more commuters to choose the subway service. The results of this study were consistent with Chaingam et al. (2019) study on service quality among Suvarnabhumi Airport Rail Link users. They found that assurance was the factor that had the greatest impact on service quality.

Factors that Influenced Satisfaction of BMTA Fan Bus Users

The factors influencing BMTA fan bus passengers' satisfaction were the perceived value of time and the tangibility factor. Most commuters who rode the fan bus focused on the matter of time. If the BMTA bus system is punctual in terms of arrival times, it provides a convenient service for users, and this encourages passengers to choose it, recognizing that the BMTA fan bus service is faster than traveling by private vehicle.

The tangibility of service quality needs to be improved, ensuring that the buses are in good condition and have a more attractive appearance. The service provider needs to keep the buses and bus stops clean, and passenger seats should be comfortable. The temperature in the bus should be maintained, while within the bus stop areas or on the buses, the fare prices should be clearly labeled according to the distance traveled. Service users take into account the cleanliness of the interior.

Factor that Influenced Satisfaction of BMTA Air-Conditioned Bus Users

The service quality factor influencing passengers' satisfaction with BMTA air-conditioned buses was responsiveness. If joined with the perceived value of time, it could predict user satisfaction. Most users have high expectations for the responsiveness factor, including that staff should be enthusiastic in providing service and helping users solve various problems. Assistance should be available for people with disabilities as part of having good human relations with users. All of these will help users to recognize the quality of service.

In addition, BMTA air-conditioned bus service needs to be available during the periods that meet user needs. Being punctual in arrival will significantly affect passengers' perception of the value of time, help them recognize that bus service is faster than traveling by private vehicle. The results of this study were consistent with a study about factors influencing air-conditioned bus service users on the route from Wat Rai Khing – Wongwian Yai (Nonn, Online, 2019). It was found that service staff were enthusiastic and willing to help at all times.

SUGGESTIONS

Suggested Applications of Research Findings

1. BTS Skytrain and BMTA air-conditioned bus service providers should focus on developing the service quality of responsiveness in terms of staff availability and willingness to serve. Speed of service and enthusiasm to meet the needs of users should increase the perceived value of time, and encourage service users to be more satisfied.

2. The MRT Subway service provider needs to realize the importance of the assurance or credibility and trust to build confidence among passengers using the service, which would encourage more commuters to choose to use the MRT Subway service. Assigning one or more staff to assist commuters as needed on subway train platforms may be one way to increase assurance, especially among new passengers.

3. The BMTA bus service provider needs to appreciate passengers' perceived value of time. The service provider should improve the tangibility factor by making the inside and outside appearance of vehicles more attractive, and installing a GPS system so passengers can track the location of arriving buses. A screen or audio system to announce the next arriving bus would assist passengers who are new to the service, and enhance user traveling experiences.

Recommendations for Future Studies

1. Investigation of taxis, canal boats, motorcycle taxis, airport rail link, or diesel train service that are based in the Bangkok area should be considered to increase the number of public transit users.

2. A comprehensive study could focus on improving fan bus service while maintaining low service fees to assist low-income users. Further study on fan bus users and pricing could be done to improve understanding of user willingness to trade better service for higher fares.

3. From this study, it was found that the MRT Subway had the highest level of satisfaction. Interested readers might consider conducting an in-depth study of characteristics and aspects of satisfaction, so that the findings could be used to develop better public transport services for all.

4. With the current low minimum wage level in Thailand, public transportation service providers could study variables that were highly correlated with user satisfaction, but have relatively low improvement costs, to avoid service fare increases.

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