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Exploring Passenger Loyalty and Related Factors for Urban Railways in Thailand

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Abstract: The research investigates the relationships among indicators related to the loyalty of urban railways passenger in Thailand at three routes, which consisted of BTS Sky train, MRT, and Airport Rail Link. The research instrument was 600 questionnaires, and the purpose was to study the indicators that affected perceived service quality and passenger loyalty by using structural equation modeling. The analysis of influence information that affects passenger loyalty revealed that trust, satisfaction, appreciation, cost of service changing, and relationships have an effect on passenger loyalty, statistically significant at 0.01. The satisfied variable was an important variable that affected passenger loyalty and was directly influenced by trust, appreciation, and perceived service quality. The perceived service quality was measured using 36 indicators and grouped into five complement groups, which were station, news, services, staffs, and vehicle, respectively. The research finding was that the cooperation concern with urban railway service can apply the result to the marketing development strategy to be a sustainable method of standardized service and urban railways system improvement.

Keywords: indicators; service quality; urban railway; loyalty; structural equation modeling

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1. Introduction

Thailand has developed transport infrastructure and public transport systems, such as air, road, water, and rail transport, on varying levels. Rail transport is one of the public transportation systems prioritized by the Ministry of Transport in Thailand. The 20 Years' Thailand Transport System Development Strategy (2017–2036) [1], which focuses on developing transport infrastructure, especially rail transport that remains an incomplete network, supports this initiative. The rail transport system in Thailand can be categorized into intercity rail, which provides services for passengers and goods transportation between cities, and urban rail, which offers services for passengers in Bangkok and its vicinity.

The government has continually provided support and developed the urban electric train system to ensure that routes cover essential metropolitan areas. People living in areas with access to electric trains have increasingly changed their means of transport from personal cars, public buses, and taxis to electric trains. The reason for this change is that they can avoid traffic jams and experience convenience in traveling, as evidenced by the increasing number of passengers using the electric train system in urban areas per year. For instance, in 2019–2020, the Bangkok (Mass) Transit System Skytrain (BTS Skytrain) had 236 million passengers and the Metropolitan Rapid Transit (MRT) pointed to an average of 102 million passengers per day. The Airport Rail Link (ARL) had 16.9 million passengers in the same year. Consequently, public transport service is a crucial factor

in attracting more passengers. Parasuraman et al. [2] argued that passengers' or users' perceived service quality can be assessed by comparing their needs or expectations to the actual service received, with perceived quality as an indicator of passenger satisfaction. Therefore, service providers examine passenger satisfaction to apply improvements to quality and service standards for sustainable urban electric trains because these aspects can enhance the quality of life and satisfaction of passengers. Furthermore, regarding the Thailand Transport System Development plan, the urban electric train system is considered and mentioned to be developed, covering Bangkok and counties as well as the major cities in every region in Thailand. Thus, the findings can be applied to the formulation of marketing strategies or policies for various services in the future.

The current study aims to investigate the indicators of the service quality of urban electric trains in Thailand using the structural equation model to examine perceived service quality and passenger loyalty toward electric train transportation.

2. Literature Review and Hypothesis Development

2.1. Service Quality

Service quality is a tool used to measure efficiency in meeting customer needs in the service business. A customer or service recipient will evaluate service quality based on experience versus expectation before using the service [2]. According to the theoretical framework of Parasuraman et al. [3], the criteria for assessing service quality, namely, SERVQUAL, consists of five dimensions, namely, tangibles, reliability, responsiveness, assurance, and empathy. A review of the previous literature indicates that studies on service quality are based on measurements that reflect the operating circumstances under consideration where service quality is hypothesized to exert a direct effect on perceived value [4,5] and positive behavioral intentions [6]. However, service quality is expected to exert an indirect effect [7–10] and a direct effect on loyalty [11,12] and overall satisfaction [6,13–15]. In addition, Zhang et al. [16] investigated the satisfaction factors of public transport and railway, such as wait time, transfer convenience, service, information, passenger comfort, station environment, and interior sanitation.

2.2. Customer Satisfaction

Satisfaction is feeling that affects the comparison between the perceived service and expected service of each person. The customer can realize satisfaction with three levels as follows; firstly, if the perceived service is lower than the expected service, the customer will be dissatisfied. Secondly, if the perceived service is equal to the expected service, the customer will be satisfied. Thirdly, if the perceived service is higher than the expected service, the customer will be very much satisfied. Grönroos [17] said that the satisfaction with the service consisted of two elements: (1) The element of perceived service, which means the customers will know that the service or goods have good quality, and this will satisfy the customers. (2) The element of perceived quality of service presentation. The customer will realize which service presentation of service process is appropriate for them, and all of these will be exactly satisfying to the customer.

2.3. Customer Loyalty

Loyalty denotes unity, encouragement, and strength or a feeling and expression of respect for another person. Specifically, brand loyalty refers to consistent satisfaction with or repurchase of a certain brand. Zeithaml et al. [18] and Bloemer et al. [19] used the customer behavior intention criteria to summarize the factors used to measure service loyalty, such as word-of-mouth, purchase intention, price sensitivity, and complaining behavior. Previous studies have found that customer loyalty is influenced by psychological or internal factors from consumers and external factors from the environment. Such factors are customer expectation, perceived service quality, customer satisfaction, perceived value, customer trust, commitment, and attractiveness of competitors [20].

The research that concerned the perceived service quality, satisfaction, and loyalty of passengers who use public transportation such as buses, airlines, and high-speed railway

abroad found that the perceived service was considered by SERVQUAL [21–23]. Moreover, Zhang et al. [24] studied the perceived service quality from the vehicle indicator, and there was a research group who studied three indicators: driver, vehicle, and administrative management. The researcher has reviewed the research about BTS in Thailand that focuses on the relationship between perceived service quality, satisfaction, and passenger loyalty by using the Marketing Mix Model (7Ps) and Thailand Customer Satisfaction Index Model (TCSI Model) to be the concept of research [25–27]; According to a previous study, there are limited indicator relation studies about public passenger loyalty. There was only Ratanavaraha and Jomnonkwao [28] who studied the indicators of public drivers. Thus, the researcher decided to study the relationship of the indicator about the perceived service quality, satisfaction, and the loyalty of urban railways passenger in Thailand, and the service quality was considered from the main facilities and infrastructure.

3. Materials and Methods

3.1. Conceptual Framework

The conceptual framework (Figure 1) showed the relationship of indicators about perceived service quality, satisfaction, perceived service quality, trust, and the indicator that influenced passenger loyalty. The models were examined under 10 hypotheses.

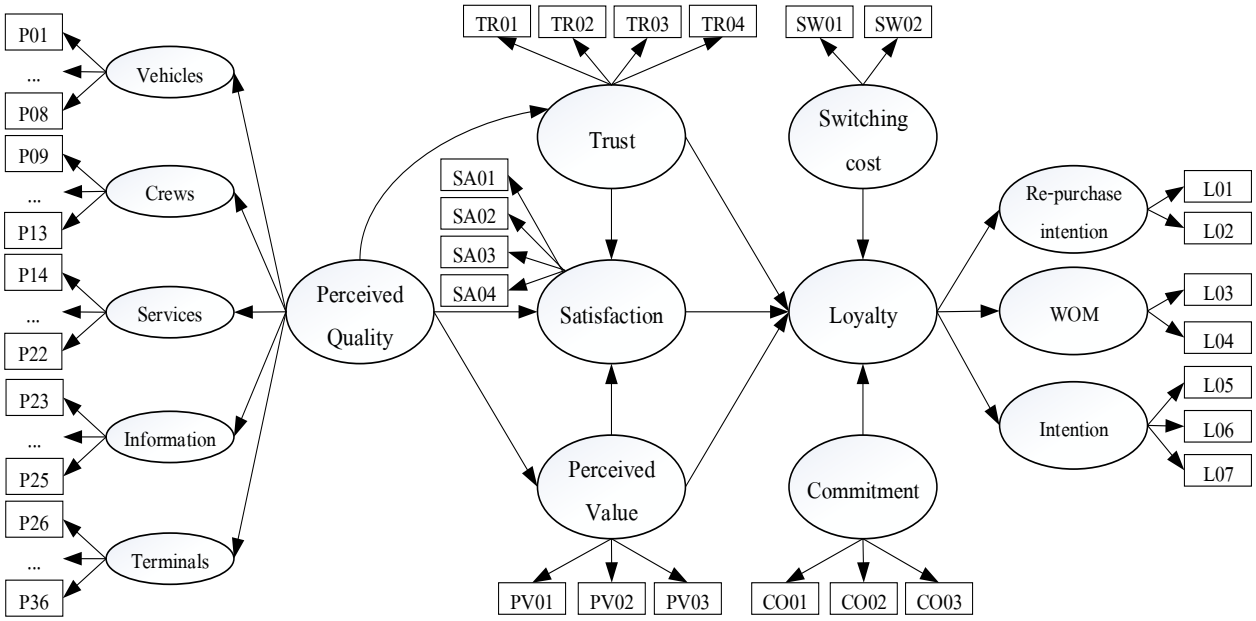

Figure 1. Conceptual Framework.

Hypotheses 1 (H1). *Perceived service quality exerts a positive effect on customer satisfaction.*

Hypotheses 2 (H2). *Perceived service quality exerts a positive effect on customer trust.*

Hypotheses 3 (H3). *Perceived service quality exerts a positive effect on customer perceived value.*

Hypotheses 4 (H4). *Service satisfaction exerts a positive effect on customer loyalty.*

Hypotheses 5 (H5). *Perceived service value exerts a positive effect on customer satisfaction.*

Hypotheses 6 (H6). *Perceived service value exerts a positive effect on customer loyalty.*

Hypotheses 7 (H7). *Trust exerts a positive effect on customer loyalty.*

Hypotheses 8 (H8). *Trust exerts a positive effect on customer satisfaction.*

Hypotheses 9 (H9). *Switching costs exerts a negative effect on customer loyalty.*

Hypotheses 10 (H10). *Commitment exerts a positive effect on customer loyalty.*

3.2. Sample

Hair and Black [19] suggested that the appropriate sample size for developing a structural equation model is approximately 500. In the current study, data collection was from February to March 2020. The samples consisted of 600 users of urban electric trains in Thailand which travel 3 routes, and quota sampling was used to choose the sample. The samples consisted of BTS Skytrain (n = 200; 33.33%), MRT users (n = 200; 33.33%), and Airport Rail Link (n = 200; 33.33%). Face-to-face interviews were conducted to collect data from electric train users around the stations and bus stops (the samples were from the passengers who were going to use service and who already used the service) near the stations of Chalong Ratchadham Line, Cha-loem Ratchamongkhon Line, Sukhumvit Line, Silom Line, and Airport Rail Link. The interview of samples took 5–10 min per person.

3.3. Variables

A total of seven major variables were analyzed, namely, satisfaction, perceived quality, loyalty, trust, perceived value, relationship, and cost of switching service providers, with 59 indicators to measure the expectation and perceived quality of electric train users in urban areas. Each item is rated using a 7-point Likert-type scale (7 = strongly agree to 1 = strongly disagree).

3.4. Reliability of the Questionnaire

To verify the quality of the research tool, five experts examined content validity and considered the consistency of each question by analyzing and scoring the questions against the index of item objective congruence (IOC). The IOC index was higher than 0.5, which means the content validity of the questionnaire is within the acceptable range. Then, a pilot study was piloted with 50 respondents who were excluded from the research. Reliability was analyzed using Cronbach's alpha coefficient. The results indicated a Cronbach's alpha coefficient of 0.784–0.965, which was greater than 0.7 [29].

3.5. Structural Equation Model

The study of the relationship between variables in a structured manner began during the early 1900s when Spearman developed an analytical method that can be considered a prototype of today's elemental analysis. The author can be regarded as the first person who elucidated the relationship between latent and structural variables in 1904 [30]. Moreover, Wright [31] was the first to examine causal modeling and develop the analytical method—a model of path analysis that can be considered the fundamental analysis of the structural equation model [30,32]. In addition, Churproong et al. [33] explained that the structural equation model is known by several names, such as covariance structure analysis. The structural equation modeling (SEM) was utilized to measure the correlation of variables in the theoretical model to illustrate the relationship between latent variables and observable variables. This model is formed through the synthesis of three essential data analysis methods, namely, factor analysis, path analysis, and parameter estimation, in regression analysis. The structural equation model consists of two sub-models, namely, the measurement model and structural model. SEM was analyzed using Mplus version 7.2 by the maximum likelihood method.

4. Results

4.1. Descriptive Analysis

Table 1 presents the analysis of the frequency and percentage of fundamental data from the 600 samples, such as passenger characteristics, travel routes, and frequency of use of service. The sample comprises 353 women (58.83%), 47 students (7.83%) below high school or equivalent, 104 students (17.33%) with a high school level or vocational certificate, 50 students (8.33%) with a higher vocational certificate, 363 people (60.50%) with bachelor's degree, and 36 people (6%) at the post-graduate levels. A total of 176 individuals (29.33%) earn more than 30,000 baht per month (this study was defined to be a group of the

highest earners by using income regulation that starts from the income of undergraduates), whereas the majority (317; 52.83%) are company employees.

Table 1. Participants' characteristics.

	Sample Categories	Frequency	Percent
Route	BTS	200	33.33
	MRT	200	33.33
	ARL	200	33.33
Gender	Male	247	41.17
	Female	353	58.83
Education	Mattayom 3 (Grade 9) and lower	47	7.83
	Mattayom 6 (Grade 12)/vocational certificate	104	17.33
	Diploma/high vocational certificate	50	8.33
	Bachelor's degree	363	60.50
	Master's degree and Doctoral degree	36	6.00
Income	Less than 10,000 (THB/Month)	8	1.33
	10,000–14,999 (THB/Month)	40	6.67
	15,000–19,999 (THB/Month)	158	26.33
	20,000–24,999 (THB/Month)	142	23.67
	25,000–29,999 (THB/Month)	76	12.67
	30,000 THB and above	176	29.33
Occupation	Government/state enterprises	57	9.50
	Company employees	317	52.83
	Personal business	121	20.17
	Farmers	1	0.17
	Students	25	4.17
	Other	79	13.17
Frequency	1–3 days/week	389	64.83
	4–5 days/week	167	27.83
	Everyday	44	7.33
	Total	600	100

Analysis of fundamental statistical values of the 59 indicators consisted of basic statistics, standard deviation, skewness, and kurtosis (Table A1 provides detailed analysis). The indicators are divided into seven groups as follows.

(1) Service quality indicators (36 variables) with five categories, namely, vehicles, staff, services, information, and stations. The result suggested that the indicator with the highest average was P28: The station is clean (mean = 5.97; SD = 1.10), followed by P13: The staff provides accurate and reliable information and services before traveling (mean = 5.94; SD = 1.02).
(2) Loyalty indicators (seven variables) with three categories, namely, word-of-mouth, identification, and repurchase. The indicator with the highest average was L01: I will use the "electric train" service for the next trip (mean = 5.59; SD = 0.88), followed by L02: If fare levels and service quality are well maintained, then I will use the "electric train" service regularly (mean = 5.56; SD = 1.00).
(3) Perceived service value indicators (three variables). The indicator with the highest average was PV02: I accept the service I received compared to the money I paid; it is reasonable (mean = 5.39; SD = 1.03).
(4) Service satisfaction indicators (four variables). The indicator with the highest average was SA02: I will use the "electric train" service on the next trip (mean = 5.59; SD = 0.88).
(5) Trust indicators (four variables). The indicators with the highest average were TR02: The "electric train" is a form of transport that I can always trust (mean = 5.53; SD = 0.99) and TR04: Overall, I am satisfied with the service provided by the "electric train" (mean = 5.53; SD = 1.14).

(6) Cost of switching service providers (two variables). The indicator with the highest average was SW01: I can waste time searching for information on "other forms of transport" that provide better service on the next trip (mean = 4.73; SD = 1.22).
(7) Relationship with service providers (three variables). The indicator with the highest average was CO03: I think traveling by "electric train" is an important form of transport for the country's development (mean = 5.77; SD = 1.16).

The maximum likelihood estimation method was used to analyze the distribution characteristics of the data. The method requires that data must have a normal distribution determined by skewness and kurtosis. Table 2 points to negative skewness values between −0.37 and −1.47, whereas kurtosis values ranged between −0.11 and 3.21. In summary, skewness was less than 3.0, whereas kurtosis was less than 10. This finding indicates that the data have a normal distribution [32]. The data are, therefore, appropriate for further analysis of the composition.

Table 2. Cut-off values of model fit indices.

Model Fit Index	Cut-Off Value	References
χ^2/df	<3	Kline [34]
SRMR	≤0.08	Wu et al. [35],Hu and Bentler [36]
RMSEA	≤0.07	Steiger [37]
CFI	≥0.90	Hu and Bentler [36]
TLI	≥0.80	Hooper et al. [38]

4.2. Structural Equation Model

4.2.1. Goodness-of-Fit Statistics

The model was found to be relatively consistent with empirical data (chi-squared = 4523.458, df = 1671, $p < 0.001$, CFI = 0.901, TLI = 0.900, SRMR = 0.061, RMSEA = 0.053). Table 2 provides the details.

4.2.2. Measurement Model

According to the conceptual framework of the research, results of the structural equation model (Figure 1 and Table 3) confirm one endogenous variable, namely, loyalty, and six exogenous variables, namely, service quality, perceived service value, service satisfaction, trust, cost of switching, and commitment. The exogenous variables are described as follows.

Table 3. Results of measurement model.

Item	Description	Loading	*t*-Value	Error Variance
	Second-Ordered Measurement Model			
	Perceived Quality			
PQ01	Vehicles	0.981 **	154.671	0.006
PQ02	Crews	0.984 **	179.870	0.006
PQ03	Services	0.985 **	178.441	0.006
PQ04	Information	0.994 **	106.516	0.009
PQ05	Terminals	0.998 **	239.268	0.004
	Loyalty			
LY01	Word of mount	0.975 **	51.663	0.019
LY02	Identification	0.653 **	21.876	0.030
LY03	Re-purchase	0.894 **	42.113	0.021
	First-ordered measurement model			
	Vehicles (Cronbach's Alpha = 0.909, AVE = 0.740, CR = 0.909)			
P01	The condition inside the car is clean and tidy.	0.756 **	39.997	0.019
P02	The temperature inside the car is cool.	0.770 **	42.571	0.018

Table 3. *Cont.*

Item	Description	Loading	*t*-Value	Error Variance
P03	The seats are clean.	0.752 **	41.648	0.018
P04	The seating arrangement is reasonable.	0.731 **	35.442	0.021
P05	Luggage compartments are large, available, and sufficient.	0.643 **	25.601	0.025
P06	There is security against criminals and crimes on board.	0.720 **	34.460	0.021
P07	Seating for special people such as elders, disabilities, pregnant women, etc., are arranged in a good location and have a reasonable amount.	0.702 **	32.211	0.022
P08	The convoy is in new condition, looks good, and is attractive.	0.782 **	45.198	0.017
	Crews (Cronbach's Alpha = 0.869, AVE = 0.750, CR = 0.876)			
P09	The staff provides fast and agility service.	0.799 **	50.100	0.016
P10	The staff provides service with good manners.	0.695 **	31.049	0.022
P11	There is adequate staff to facilitate when getting on and off the electric train.	0.770 **	43.418	0.018
P12	When problems occur during the trip, the staff is willing to help resolve the issue.	0.739 **	38.225	0.019
P13	The staff provides accurate and reliable information and services before traveling.	0.770 **	43.858	0.018
	Services (Cronbach's Alpha = 0.898, AVE = 0.700, CR = 0.904)			
P14	There are adequate ticket distribution channels.	0.720 **	34.185	0.021
P15	The fare collection system is modern and accurate.	0.766 **	41.979	0.018
P16	The fare collection and ticket distribution systems are user friendly.	0.754 **	40.560	0.019
P17	The fare is reasonable.	0.634 **	24.717	0.026
P18	The density of the train during rush hour is suitable.	0.641 **	25.274	0.025
P19	The density of the train apart from the rush hour is suitable.	0.735 **	36.720	0.02
P20	The frequency of the train is appropriate and sufficient.	0.739 **	38.242	0.019
P21	Organize a promotion for passengers.	0.665 **	27.752	0.024
P22	There is a special discount for passengers with prepaid tickets.	0.697 **	31.345	0.022
	Information (Cronbach's Alpha = 0.755, AVE = 0.741, CR = 0.785)			
P23	There are announcements regarding arrival time and the change of departure time of the train.	0.725 **	34.371	0.021
P24	There is a channel for complaints at the station via telephone or online.	0.700 **	31.645	0.022
P25	The station has sufficient navigation signs and travel information.	0.780 **	42.656	0.018
Item	Description	Loading	t-value	Error Vaiance
	Terminal (Cronbach's Alpha = 0.922, AVE = 0.711, CR = 0.919)			
P26	The suitability of the station location allows easy service access.	0.641 **	25.654	0.025
P27	There are facilities for disabilities to access the station, such as passenger elevators.	0.655 **	26.858	0.024
P28	The station is clean.	0.712 **	33.866	0.021
P29	There is a suitable waiting area to buy tickets.	0.735 **	38.000	0.019
P30	The ticket checking machines for accessing the platform are sufficiently wide enough to walk through.	0.699 **	32.215	0.022
P31	There are convenient walkways such as the Sky Walk connecting to essential places.	0.671 **	28.617	0.023
P32	There is security against criminals and crime at the station.	0.742 **	38.273	0.019
P33	There are other facilities such as Wi-Fi, services, and shops within the station.	0.729 **	36.721	0.02
P34	The station's ascent and descent are convenient and safe.	0.720 **	34.942	0.021
P35	It is convenient to connect to other transportation systems.	0.756 **	40.619	0.019
P36	The arrangement of the platform area is proper.	0.749 **	39.656	0.019

Table 3. *Cont.*

Item	Description	Loading	*t*-Value	Error Variance
	Word-of-mouth (Cronbach's Alpha = 0.794, AVE = 0.793, CR = 0.722)			
L01	I will use the "electric train" service for the next trip.	0.769 **	37.862	0.02
L02	If fare levels and service quality are well maintained, I will use the "electric train" service forever.	0.823 **	44.407	0.019
	Identification (Cronbach's Alpha = 0.834, AVE = 0.797, CR = 0.841)			
L03	I will mention only good things about "electric train traveling" with others	0.909 **	39	0.023
L04	I will encourage friends and acquaintances to travel by the "electric train".	0.777 **	710	0.025
L05	I rank this "electric train" as the first mode of transport for each trip.	0.615 **	31	0.03
	Re-purchase (Cronbach's Alpha = 0.778, AVE = 0.786, CR = 0.764)			
L06	I think the "electric train" is the best choice.	0.748 **	639	0.022
L07	I will not be interested in other modes of transportation besides the "electric train".	0.828 **	20.477	0.02
	Perceived value (Cronbach's Alpha = 0.880, AVE = 0.846, CR = 0.884)			
PV01	When comparing to the service I received, I think it is worth the money.	0.838 **	54.122	0.015
PV02	I accept the service I received compared to the money I paid; it is reasonable.	0.897 **	69.783	0.013
PV03	When I travel by the "electric train", I think it is more rewarding than other transportation forms.	0.804 **	45.646	0.018
	Satisfaction (Cronbach's Alpha = 0.872, AVE = 0.781, CR = 0.863)			
SA01	I am pleased to use the "electric train" service.	0.814 **	49.371	0.016
SA02	Overall, I am satisfied with the service provided by the "electric train".	0.868 **	62.168	0.014
SA03	The quality of service I received was more than what I expected.	0.706 **	31.229	0.023
SA04	The quality of service I received is at the service level I dreamed of.	0.676 **	27.812	0.024
	Trust (Cronbach's Alpha = 0.901, AVE = 0.835, CR = 0.902)			
TR01	I believe that traveling by the "electric train" is the best form of transportation.	0.827 **	53.717	0.015
TR02	The "electric train" is a form of transport that I can always trust.	0.848 **	59.965	0.014
TR03	The "electric train" is a form of transport that recognizes what to do to satisfy customers.	0.811 **	49.578	0.016
TR04	The "electric train" is very reliable form of transport.	0.854 **	62.168	0.014
	Switching cost (Cronbach's Alpha = 0.833, AVE = 0.850, CR = 0.841)			
SW01	I can waste time searching for information on "other forms of transport" that provide better service on the next trip.	0.924 **	15.577	0.059
SW02	I will pay more to switch to "other forms of transport" if they provide better service.	0.775 **	14.878	0.052
	Commitment (Cronbach's Alpha = 0.839, AVE = 0.806, CR = 0.851)			
CO01	I am proud to use the "electric train" service.	0.714 **	22.049	0.032
CO02	I am concerned for the long-term success of "BTS/MRT/Airport Rail Link".	0.811 **	29.157	0.028
CO03	I think traveling by the "electric train" is an important form of transport for the country's development.	0.755 **	26.763	0.028

Note: regression. ** significant at $\alpha = 0.001$.

(1) Loyalty. Based on the analysis of the second-order model regarding loyalty to service providers with statistical significance at the 0.001 level, the study found that the three indicators confirmed the composition of loyalty to service providers (word-of-mouth:

λ = 0.975; identification: λ = 0.653; re-purchasing: λ = 0.894). Furthermore, based on the results of the first confirmatory component model for loyalty to service providers with statistical significance at the 0.001 level, the study found the following results.

Word-of-mouth (measured using two indicators: L01–L02). All indicators verified the composition of the measurement model for loyalty to service providers with standardized factor loadings between 0.823 and 0.769. The indicator with the highest standardized factor loading is L02: I will encourage friends and acquaintances to travel using the "electric train" (λ = 0.823), whereas L01: I will mention only good things about traveling via "electric trains" and others obtained the least standardized factor loading (λ = 0.769).

Identification (measured using three indicators: L03–L05). The study found that all indicators confirmed the composition of the measurement model regarding loyalty to service providers with standardized factor loadings between 0.909 and 0.615. The highest and lowest factor loadings were found for indicator L03: I rank this "electric train" as the first choice of mode of transport for each trip (λ = 0.909) and L05: I will not be interested in other modes of transportation besides the "electric train" (λ = 0.615), respectively.

Re-purchasing (measured using two indicators: L06–L07). All indicators verified the composition of the measurement model for loyalty to service providers. The standardized factor loadings ranged between 0.828 and 0.748 with the highest and lowest standardized factor loadings found for L07: If fare levels and service quality are well maintained, I will use the "electric train" service regularly (λ = 0.828) and L06: I will use the "electric train" service for the next trip (λ = 0.748), respectively.

(2) Service quality. In terms of the second-order model for loyalty to service providers with statistical significance at the 0.001 level, five indicators verified the composition of service quality, namely, vehicles (λ = 0.981), staff (λ = 0.984), service (λ = 0.985), information (λ = 0.994), and station (λ = 0.998). Additionally, regarding the results of the first-order model for loyalty to service providers with statistical significance at the 0.001 level, the study found the following results:

Vehicles (measured using eight indicators: P01–P08). All indicators confirmed the composition of the measurement model in terms of service quality with standardized factor loadings between 0.782 and 0.643. The highest and lowest standardized factor loadings were observed for P08: The convoy is in new condition, looks good, and is attractive (λ = 0.782) and P05: Luggage compartments are large, available, and sufficient (λ = 0.643), respectively.

Staff (measured using five indicators: P09–P13). All indicators confirmed the composition of the measurement model regarding service quality with standardized factor loadings between 0.799 and 0.695. The indicators with the highest and lowest standardized factor loadings were P09: The staff provides fast and agile service (λ = 0.799) and P10: The staff provides service with good manners (λ = 0.695), respectively.

Service (measured using nine indicators: P14–P22). The indicators verified the composition of the measurement model regarding service quality with standardized factor loadings between 0.766 and 0.634. The highest and lowest standardized factor loadings were found for P15: The fare collection system is modern and accurate (λ = 0.766) and P17: The fare is reasonable (λ = 0.634), respectively.

Information (measured using three indicators: P23–P25). Indicators under this category verified the composition of the measurement model regarding service quality with standardized factor loadings ranging from 0.780 to 0.700. The highest and lowest standardized factor loadings were found for P25: The station has sufficient navigation signs and travel information (λ = 0.780) and P24: There is a channel for complaints at the station via telephone or online (λ = 0.700), respectively.

Station (measured using 11 indicators: P26–P36). The study found that all indicators verified the composition of the measurement model regarding service quality with standardized factor loadings ranging from 0.756 to 0.641. The indicators with the highest and lowest standardized factor loadings were P35: It is convenient to connect to other

transportation systems (λ = 0.756) and P26: The suitability of the station location allows easy access to services (λ = 0.700), respectively.

(3) Service value (measured using three indicators: PV01–PV03). The study observed that all indicators were able to verify the composition of the measurement model regarding service value with standardized factor loadings ranging from 0.897 to 0.804. The indicators with the highest and lowest standardized factor loadings were PV02: I accept the service I received compared to the money I paid; it is reasonable (λ = 0.897) and PV03: When I travel by the "electric train," I think it is more rewarding than other transportation forms (λ = 0.804), respectively.

(4) Service satisfaction (measured using four indicators: SA01–SA04). The results show that all indicators confirmed the composition of the measurement model regarding service satisfaction with standardized factor loadings ranging from 0.868 to 0.676. The indicators with the highest and lowest standardized factor loadings were SA02: Overall, I am satisfied with the service provided by the "electric train" (λ = 0.868) and SA04: The quality of service I received is at the service level I dreamed of (λ = 0.676), respectively.

(5) Trust (measured using four indicators: TR01–TR04). The study found that all indicators asserted the composition of the measurement model regarding reliability with standardized factor loading ranging from 0.854 to 0.811. The indicators with the highest and lowest standardized factor loadings were TR04: The "electric train" is a very reliable form of transport (λ = 0.854) and TR03: The "electric train" is a form of transport that knows what to do to satisfy customers (λ = 0.811), respectively.

(6) Cost of switching service providers (measured using two indicators: SW01–SW02). All indicators confirmed the composition of the measurement model regarding the cost of switching service providers with standardized factor loadings ranging from 0.924 to 0.755. The highest and lowest standardized factor loadings were noted for SW01: I can waste time searching for information on "other forms of transport" that provide better service on the next trip (λ = 0.924) and SW02: I will pay more to switch to "other forms of transport" if they provide better service (λ = 0.755), respectively.

(7) Relationship with service providers (measured using three indicators: CO01–CO03). All indicators pointed to composition of the measurement model regarding the relationship with service providers with standardized factor loadings between 0.811 and 0.714. The indicators with the highest and lowest standardized factor loadings are CO02: I am concerned about the long-term success of "BTS/MRT/Airport Rail Link" (λ = 0.811) and CO02: I am proud to use the "electric train" service (λ = 0.714), respectively.

4.2.3. Structural Model

The SEM analysis result could examine hypotheses relevant to the direct influence of variables affecting te loyalty of urban electric train customers (Table 4). Study results found that perceived service quality influenced satisfaction, trust, and perceived service value, with a statistically significant level of 0.001 (β = 0.131, β = 0.700, and β = 0.587), which supports H1, H2, and H3, respectively. Service satisfaction positively influenced customer loyalty (β = 0.375, $p < 0.001$), which supports H4. Perceived service value influenced satisfaction and customer loyalty (β = 0.309 and β = 0.326, $p < 0.001$), which supports H5 and H6. Trust influenced loyalty and the satisfaction of customer (β = 0.137, $p < 0.05$ and β = 0.587, $p < 0.001$), which supports H7 and H8. Furthermore, switching costs was negatively correlated with customer loyalty (β = −0.084, $p < 0.001$), which supports H9. Finally, commitment was positively correlated with customer loyalty (β = −0.261, $p < 0.001$), which supports H10.

Table 4. Results of structural model.

Item	Description	Estimates	*t*-Value	Error Vaiance
H01	Perceived quality ⇨Satisfaction	0.131 **	3.071	0.043
H02	Perceived quality ⇨Trust	0.700 **	29.233	0.024
H03	Perceived quality ⇨Perceived value	0.587 **	19.319	0.030
H04	Satisfaction ⇨Loyalty	0.375 **	4.695	0.080
H05	Perceived value ⇨Satisfaction	0.309 **	7.487	0.041
H06	Perceived value ⇨Loyalty	0.326 **	6.517	0.050
H07	Trust ⇨Loyalty	0.137 *	1.894	0.072
H08	Trust ⇨Satisfaction	0.587 **	13.044	0.045
H09	Switching cost ⇨Loyalty	−0.084 **	−2.525	0.033
H10	Commitment ⇨Loyalty	0.261 **	5.372	0.261

Note: regression. * Significant at $\alpha = 0.05$; ** significant at $\alpha = 0.001$.

5. Discussion and Conclusions

This study's aim is to examine 10 hypotheses in total and to study factors affecting passenger loyalty toward urban the electric train service in Thailand by using SEM. The findings of this research are as follows: According to SEM, there are five hypotheses relevant to customer loyalty, including satisfaction (H4), service value (H6), trust (H7), switching costs (H9), and commitment (H10), which are in accordance with the research of H4 [39], H6 [40], H7 [41], H9 [23], and H10 [42], respectively. There is Hypothesis 3, which is in relevant to customer satisfaction, perceived service quality (H1), perceived service value (H5), and trust (H8), which are in accordance with the research of H1 [40,43], H5 [43], and H8 [41], in order. Moreover, there are hypotheses relevant to perceived service quality, trust (H2), and perceived service quality (H3), which are in accordance with the research of H2 [44], and H3 [45–47]. In addition, when we consider the factors directly influencing customer loyalty, which are trust, satisfaction, perceived service value, switching costs, and commitment, we found that satisfaction is the most important factor that affects customer loyalty, while satisfaction is directly influenced by trust, perceived service value, and perceived service quality of customer. Therefore, service providers must give priority to the mentioned issues in order to make customers satisfied and re-purchase the service.

In reference to this study, the researcher has studied variables relevant to perceived service quality of passengers, which can be measured from 36 indicators by using second order confirmatory factor analysis with the statistically significant level at 0.001. It found that the indicators that can be the most confirmatory factors of perceived service quality are station, information, service, staff, and vehicle, consecutively. Additionally, when we consider the first order confirmatory factor analysis result of perceived service quality with the statistically significant level at 0.001, we find that the indicator of station about which customers express the most concern is convenience of connection to other types of transport systems (P35), while the indicator of information about which customers express the most concern is that there are proper guide posts and travel information at the station (P25). Additionally, the indicator of service about which customers express the most concern is that there is a modern and accurate fare collecting system (P15).

This study could summarize that there are many variables influencing satisfaction, which is the main factor causing customer loyalty. In order to keep the recent group of customers, as well as to increase future customers [48], electric train service providers should add such service provision value by prioritizing relevant factors, e.g., for the station factor, electric train service providers should give priority to convenience of connecting the electric train to other types of transport systems. Additionally, for the information factor, service providers should provide guide posts and travel information service at the station to facilitate traveling the most. The findings of this research could be used by organizations relevant to urban electric train service provision by applying marketing development strategy and service policy, in order to be a guideline for service standards and the sustainable improvement of the urban electric train system, e.g., connection between

the electric train system and other types of public transportation such as buses, taxis, and motorcycle taxis at the station, which facilitate customers by connecting the traveling and ticket promotional campaign, as well as the development of a modern and accurate fare collecting system, i.e., a ticket vending machine or payment through mobile application, which will generate more convenience for customers who use the service. This study has offered an overall picture of the electric train service in Thailand, but we do not separately consider service providers of each route. Therefore, for further study, there should be an examination of electric train service providers of each route (electric train routes and State Railway of Thailand) to create a suitable roadmap in accordance with the sustainable travel characteristic of customers in Thailand.

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Appendix A

Table A1. Descriptive statistics.

Item	Mean	SD	Sk	Ku
P01	5.92	1.07	−1.47	3.15
P02	5.84	1.11	−1.35	2.72
P03	5.74	1.10	−0.88	0.58
P04	5.55	1.16	−0.72	0.41
P05	5.40	1.28	−0.82	0.43
P06	5.68	1.10	−1.08	1.71
P07	5.70	1.18	−1.20	1.73
P08	5.82	1.09	−1.20	1.79
P09	5.73	1.13	−1.15	1.88
P10	5.82	1.02	−1.04	1.63
P11	5.63	1.05	−0.96	1.44
P12	5.74	1.13	−1.10	1.42
P13	5.94	1.02	−1.46	3.21
P14	5.75	1.07	−1.00	1.49
P15	5.76	1.04	−1.00	1.41
P16	5.66	1.11	−1.01	1.42
P17	5.36	1.27	−0.72	0.32
P18	5.31	1.37	−0.92	0.53
P19	5.40	1.21	−0.87	0.70
P20	5.60	1.14	−0.91	0.86
P21	5.32	1.26	−0.66	−0.05
P22	5.32	1.25	−0.73	0.36
P23	5.68	1.06	−0.86	0.82
P24	5.47	1.36	−0.93	0.29

Table A1. *Cont.*

Item	Mean	SD	Sk	Ku
P25	5.73	0.85	−0.58	0.77
P26	5.78	1.08	−0.92	1.23
P27	5.85	1.04	−1.06	1.48
P28	5.97	1.10	−1.21	1.65
P29	5.61	1.10	−0.95	1.19
P30	5.61	1.05	−0.90	1.03
P31	5.63	1.23	−0.95	0.68
P32	5.64	1.10	−0.94	1.21
P33	5.66	1.06	−0.75	0.36
P34	5.73	0.98	−1.13	2.72
P35	5.75	1.00	−1.07	1.96
P36	5.61	1.05	−1.05	1.62
L01	5.59	0.88	−0.39	0.42
L02	5.57	1.00	−0.53	0.03
L03	5.45	1.01	−0.53	0.59
L04	5.48	1.01	−0.59	0.54
L05	5.17	1.14	−0.52	0.10
L06	5.19	1.23	−0.73	0.40
L07	4.72	1.54	−0.55	−0.28
PV01	5.38	1.04	−0.37	−0.12
PV02	5.40	1.04	−0.40	−0.12
PV03	5.29	1.12	−0.45	0.00
SA01	5.41	1.05	−0.46	0.11
SA02	5.53	1.03	−0.74	0.68
SA03	5.37	1.05	−0.63	0.51
SA04	5.27	1.13	−0.64	0.36
TR01	5.47	1.05	−0.47	0.20
TR02	5.54	1.00	−0.63	0.84
TR03	5.49	1.06	−0.73	0.89
TR04	5.53	1.15	−0.74	0.48
SW01	4.74	1.22	−0.45	−0.11
SW02	4.61	1.32	−0.41	−0.14
CO01	5.26	1.12	−0.47	0.40
CO02	5.33	1.09	−0.31	−0.17
CO03	5.77	1.17	−0.90	0.58

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