

# The Interrelationship Between Perceived Quality, Perceived Value and User Satisfaction Towards Behavioral Intention in Public Transportation: A Review of the Evidence

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**Abstract**— The most critical concern to the public transportation service is the low number of ridership. The lack of enthusiasm to use public transportation is because the passengers were not satisfied with the service provided. Thus, researchers across the globe are focusing on investigating the factors that affect user satisfaction and the consequences of user satisfaction in the public transportation service. However, a review of the evidence across public transportation mode and region has shown a lack of comprehensive investigations. Thus, this paper seeks to bridge the literature gap by reviewing the evidence to justify the relationship between the antecedents of user satisfaction, such as perceived quality and perceived value, and the consequence of user satisfaction, namely complaints and loyalty to the provided service. Based on the literature review, it is concluded that the perceived quality and perceived value have a significant effect on user satisfaction. Also, the satisfied user leads to loyalty to the service and can reduce the number of complaints. This study has established that the root of this relationship is the quality of the service provided. Hence, service providers need to prioritize this factor to ensure user satisfaction, which will increase their loyalty to the offered service. This research will help the service provider ensure the survival of their business and bring benefits to the environments through reduced traffic congestion and pollution.

**Keywords**— public transportation; public transit; user satisfaction; perceived quality; perceived value.

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## I. INTRODUCTION

The present expansion of the global economy has led to urbanization phenomena in many countries. This urbanization is not limited to modern and developed countries but also occurs in developing countries such as Indonesia, Malaysia, and Thailand [1], [2]. Urbanization is a complex process that transforms rural areas into an urban landscape [1]. Shen et al. [3] contended that urbanization has reshaped and transformed the landscape of cities. Consequently, the demand for transportation to facilitate mobility is higher in urban areas due to the higher population. People depend on private transportation for their daily travel, which has resulted in problems related to the environment and quality of life, such as air pollution, noise pollution, accidents, and traffic congestion [4]–[7].

Public transportation is the most vital alternative for solving these problems [5]–[10]. Reducing the dependency on private transport and increasing public transportation use, especially in an urban setting, is a challenging task [11]. Many transportation researchers, policymakers, and practitioners have studied the causes and strategic ways to persuade the public to use public transportation as an

alternative mode of travel instead of using private transport [5]. Numerous studies have shown that people do not choose public transportation as their preferred mode of travel is the low quality of transportation service [12]–[15]. Private transport is attractive because it is more flexible, comfortable, private, and faster [16], [17]. Public transportation authorities or providers should provide the services required by the users or potential users. In order to be able to do this, they need to look from the users' perspective. At present, many studies are being carried out to understand user satisfaction and user loyalty in the field of transportation. Researchers are investigating the different factors (constructs) influencing public transportation user's satisfaction and loyalty. For example, the studies conducted by Van Lierop and El-Geneidy [18], Jomnonkwo et al. [19], and Hussain et al. [20] focused only on service quality. Chou and Kim [21], Kuo and Tang [22], and Yilmaz and Ari [23] took into account corporate image along with service quality to predict the behavioral intention towards different forms of public transports. Other researchers have expanded the exploration of behavioral intention by adding other constructs, such as perceived value [3], [24], trust [25], [26], and user expectation [3], [27].

Only a small number of specific studies have been conducted in transportation to explore the relationships between the constructs. To bridge this gap, this paper aims to review the relationship between antecedents of user satisfaction. This study perceived quality and value with their consequence of user satisfaction. They are behavioral intentions (user complaint and user loyalty) based on the framework in Fig. 1 by providing evidence. This study hopes to provide a concrete justification and information

concerning these issues to public transportation researchers, engineers, policymakers, and practitioners.

The following section will discuss the concept of user satisfaction and user loyalty in the context of public transport and the service quality, perceived quality, and perceived value of public transportation in Section II. Also, Section III discussed the effect of perceived value and perceived quality on user satisfaction. Section III will also discuss the effect of user satisfaction on behavioral intention, and finally, Section IV presents the conclusions.

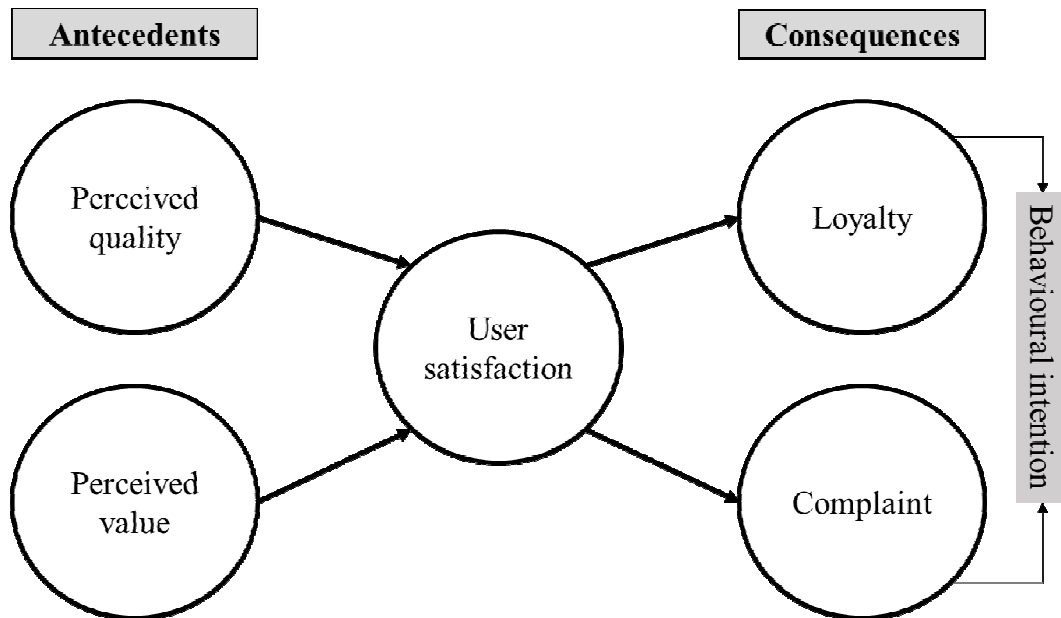


Fig. 1 The framework of the current literature review

## II. MATERIAL AND METHOD

### A. Concept of Satisfaction and Loyalty in Public Transport

Numerous studies on user (or customer) satisfaction and loyalty have been conducted globally in various research domains such as marketing [28], tourism [29], and public transportation service [30]–[32]. These researchers have proposed several definitions for user satisfaction and user loyalty.

For example, Yilmaz and Ari [23] and De Oña et al. [33] defined user satisfaction as users’ accomplishment response [34]. In other words, user satisfaction is the degree of users’ perception of whether the service is acceptable or unacceptable. Yang and Peterson [35] defined satisfaction as an overall evaluation based on the total experience (consume or purchase) with goods or services over time. The definition proposed by Oliver [36] is that satisfaction in the case of public transportation is the gap between users’ pre-defined expectation (expected quality) and the overall experience (perceived quality) with public transportation service [37]; this is also known as “expectancy disconfirmation” [4].

Loyalty has been academically described as “*Deep-rooted dedication to consistently repeat the purchase*” (p. 34) [36]. In other words, loyalty is “the intention of the consumer to repurchase the product or service provided by a service provider” [23]. Analogously, Morgan and Hunt [38] defined

user loyalty as repeated purchase from a service provider and becoming a customer to the service provider again in the future. Chou and Kim [21] did not limit the definition of user loyalty to only the tendency to continue using the provided service; instead, they extended the definition to include the willingness to recommend the service to others. Leppäniemi et al. [39] and Yang and Peterson [35] proposed that loyalty consists of two elements, i.e., attitudinal and behavioral elements. The attitudinal element of loyalty is the likeliness to continue engaging with the service provider [35]. Concerning the behavioral element, Neal [40] noted that loyalty is defined as repeat patronage.

In the case of public transportation service, according to Van Lierop et al. [41], user loyalty is the users’ intention to use a service in the future based on their previous experience of using that service. Therefore, in this study, user loyalty is defined as users’ overall satisfaction with the service provided, the likeliness to continuously use the service in the future, and the willingness to recommend it to everyone. Researchers have highlighted that the most effective ways to preserve the user-service provider relationship are by providing an excellent and high-quality product or service [34], [42], [43].

### B. *The Service Quality, Perceived Quality and Perceived Value*

Service quality is generally known as the contrast between the expectation and the actual performance, while perceived quality, also known as perceived service quality, is perceived by the user [3]. Currently, many studies related to service quality in the context of public transportation have been conducted. Notwithstanding, the researchers' service factor is different among the type of public transportation investigated and the region of study. For example, Weinstein [44] conducted a study in the USA, which considered 18 service factors in determining user satisfaction amongst transit riders. Machado-Leóna et al. [45] studied 21 different rail-based public transportation service quality in Algeria. In a recent study, Irtema et al. [6] divided service quality into two components, namely core service (e.g., information facilities, fare and service frequency) and physical environment (e.g. vehicle stability and security and cleanliness of the facility). Also, other previous works and the different types of service quality included in those studies were summarised in Table I. Van Lierop et al. [41] contended satisfaction might be related to one specific component or a combination of several components of the overall service, or the overall service. This concept is well established in the literature.

Another critical element of user satisfaction with service quality is perceived value. Perceived value has its origin in the equity theory, which deals with the ratio of input or the outcome of customer and service provider [46]. According to Bolton and Drew [47], the concept of equity theory is the customer's judgement of what is right, fair or deserved to the perceived value that offered. In other words, according to Zeithaml [48], it is related to the overall customer (or user) assessment based on their perception of the product (or service) offered by the supplier (or service provider). Specifically, as stated by Lovelock in Lai and Chen [11], perceived value is generated between perceived cost and perceived benefits. According to Yang and Peterson [35], perceived value can be divided into two categories, namely (1) monetary and (2) nonmonetary investment. The monetary investment is where payment for the product (or service quality) provided is made using banknote. The nonmonetary investment includes stress experience, time, and energy consumption. In a recent study, Irtema et al. [6] only considered a monetary payment to evaluate the perceived value that affects public transportation users' behavioral intention in Kuala Lumpur. This study is similar to the study conducted by Fu et al. [27] which only considered a monetary payment to evaluate perceived value. Other studies, such as Yang and Peterson [35] and Lai and Chen [11], considered both monetary and nonmonetary investment in exploring perceived value.

## III. RESULTS AND DISCUSSION

### A. *Impact of Perceived Quality on User Satisfaction*

To date, practitioners and researchers from many different disciplines have been showing increasing interest in service quality theory and practice. In many reviewed literature, service quality is considered a significant predictor for customer satisfaction [49]–[51]. High service quality leads to higher perceived quality by the customers. Many studies in this domain have reported that perceived quality has a considerable influence on customer (or user) satisfaction.

In the rail-based public transport, Mouwen [7] investigated 16 service attributes to determine the factors that contribute to user satisfaction. Results show that travel speed, punctuality, and service quality are among the most important attributes influencing user satisfaction. Another evidence from the rail-based industry is a study conducted in India by Geetika [52]. This study found that service quality is an essential determinant of user satisfaction in the railway industry. Behavioral and refreshment factors have the most substantial influence in enhancing user satisfaction. Lai and Chen [11] investigated the Kaohsiung Mass Rapid Transit (KMRT) and found that service quality is statistically significant in determining KMRT user satisfaction. Other studies (see Table I) have reported similar outcomes. Two studies conducted in Turkey have shown that the service quality of metro [53] and high-speed rail [23] is directly proportional to the user satisfaction level.

At present many types of research have been conducted concerning the service quality of bus services. Tyrinopoulos and Antoniou [54] contended that service quality, mainly service frequency, transportation environment and accessibility, are essential attributes that should be given priority by the public transportation authority to improve user satisfaction. Accessibility is one of the critical factors in the transportation system. Saif et al. [55] highlighted the importance of the public transportation system being able to provide a “door to door mobility” service. Moreover, a study by Dell’Olio et al. [56] has proven that public transportation authority's excellent service quality has a positive effect on user satisfaction. This study focused on the service quality desired by the users and potential users of public bus service. Both groups of respondents desire different service attributes. Service attributes such as cleanliness, waiting time and comfort are the most valued attributes by current users. However, potential users expect a shorter waiting time, high level of occupancy and short journey time. By giving priority to these factors, users' perception of service quality will be enhanced, thereby increasing the level of satisfaction of current users, and attracting new users. This outcome is also in line with the findings of other studies that focused on bus service (see Table I).

TABLE I  
COMPONENT OF SERVICE QUALITY OF PUBLIC TRANSPORTATION REVIEWED IN CURRENT LITERATURE

Year	2000	2003	2007	2008	2013	2013	2014	2015	2015	2016	2016	2017	2017	2017	2018	
Region	USA	USA	USA	Greece	Malaysia	Spain	Spain	The Netherlands	Italy	Republic of China	Italy	Algeria	Turkey	Turkey	Malaysia	
Type of Public Transportation	Rail	Bus	Bus	Bus and rail/metro	Monorail	Bus	Bus	Bus, tram, train and metro	Rail	Rail rapid transit	Rail	Tramway, metro and commuter	Metro	High-speed rail	Bus and Rail	
Reference	[44]	[57]	[58]	[54]	[59]	[60]	[61]	[7]	[62]	[3]	[63]	[45]	[53]	[23]	[6]	
Type of Service Quality	Frequency	X			X		X	X	X	X	X	X	X			X
	Network coverage			X	X	X						X	X			
	Service provision hours	X	X	X							X	X	X			X
	Station parking	X		X		X		X		X						
	Accessibility	X	X		X	X	X		X			X	X	X	X	
	Easy of transfer/ Distance	X		X	X							X	X		X	
	Ticket price		X			X	X	X	X	X	X	X	X		X	X
	Ticket selling network	X				X			X		X	X	X		X	X
	Type of tickets/ Passes				X						X	X			X	
	On board information	X	X	X	X	X	X	X	X	X	X	X	X		X	X

Type of Service Quality	Information at station		X		X			X	X	X	X	X	X		X	X	
	Reliability		X	X													
	Punctuality	X		X	X	X	X	X	X	X	X	X	X	X			
	Access time		X				X		X		X	X	X		X		
	Travel speed			X			X		X		X	X	X	X			
	Waiting time			X	X								X	X			
	Transfer time	X		X													
	Driver and personnel's behavior	X	X	X	X	X	X	X	X	X	X	X		X		X	
	Customer service		X	X									X		X	X	
	Cleanliness	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
	Comfort	X	X	X		X	X	X	X	X	X	X	X	X	X	X	
	Seating capacity	X	X			X			X		X	X	X	X			
	Quality of vehicles	X			X			X		X		X	X				
	Noise								X						X		
	Temperature	X					X				X		X	X	X		
	Waiting condition	X	X		X	X											
	Onboard safety		X	X		X	X	X	X	X	X	X	X	X	X		X
	Safety at station				X				X		X	X	X	X		X	
	Corporate Image														X		
Environmentally friendly					X												

### *B. Impact of Perceived Value on User Satisfaction*

The relationship between perceived value and user satisfaction is the issue of 'word of mouth' and is frequently debated in the service marketing literature. Perceived value is known to be one of the factors influencing satisfaction and behavior intentions. The evidence for this has been provided by Cronin et al. [64] and Petrick [65]. According to Zeithaml [48], customers who have the perception that they have received "value for money" are more satisfied than customers with the perception that they have not received "value for money". In a nutshell, customers expect to invest less amount of money for every service or product. This finding is in line with the findings made by Konuk [66], where a customer's perceived value towards organic private label food product is higher when the price of the product is lower. There is a plethora of evidence in the marketing literature that perceived value and customer satisfaction are statistically significant [39].

Many studies in the field of transportation have shown that user satisfaction is positively affected by perceived value. A questionnaire study conducted in China by Shen et al. [3] has concluded that perceived value has a positive and direct relationship with the Suzhou rail transit system's users' satisfaction. More recently, Irtema [6] analyzed 412 public transportation users' response by using a structural equation model (SEM). The researchers have demonstrated that perceived value and user satisfaction of public transportation in Kuala Lumpur is statistically significant. Also, the outcome of a case study on the KMRT in Taiwan conducted by Lai and Chen [11] has shown that perceived value is significantly correlated with user satisfaction.

Another evidence has been provided by Hussein and Hapsari [67] through their study on the Bus Rapid Transit (BRT) in Indonesia. The researchers employed 152 survey data and Partial Least Squares (PLS) and have proven that perceived value has a significant influence on user satisfaction. Similarly, Sumaedi et al. [68] reported that perceived value has a direct and positive effect on the paratransit's passenger of public transportation in Jakarta, Indonesia. Also, Wen et al. [69], in their study on user loyalty towards intercity bus service, have demonstrated that the connection between perceived value and user satisfaction is statistically significant and confirmed. This finding is consistent with those of other empirical studies in the context of public transportation [24], [70].

### *C. Impact of Satisfaction on User Behavioral Intentions*

Table II summarized the different consequences from public transportation user satisfaction such as behavioral intention, user complaint and loyalty. Lai and Chen [11] and Irtema et al. [6] have generally considered the behavioral intention as a consequence of user satisfaction in their study. While, other studies, as shown in Table II, investigated more specific elements, namely complaint and loyalty because of satisfaction. Complaints and loyalty are different types of

behavioral intentions [3]. According to Matusitz and Breen [71], complaints is generally known as the customer's (or user's) response due to the perceived dissatisfaction with a product (or service). Oliver [34] stated that customers would firstly make a complaint about the service provider if they were not satisfied with a service or product; this would eliminate their dissatisfaction. Loyalty, as has been discussed early in the previous section, is the intention of a customer (or user) to repurchase the product (or service) provided [21], [23], [72].

To date, many studies have been conducted globally to measure the impact of customer satisfaction on complaints and loyalty [39]. Nevertheless, in the field of transportation, the number of studies concerning complaints and loyalty is still limited due to the complex measurement of both types of behavioral intention [3]. Hence, many researchers have focused on behavioral intention in their studies [6], [11]. Previous research has proven that user satisfaction is closely linked with the behavioral intention [6].

According to Anderson and Fornell [73] and Chou and Kim [21], the American Customer Satisfaction Index (ACSI) model shows that dissatisfaction leads to complaints, and that customer satisfaction can reduce the number of complaints. This result is supported by Shen et al. [3]; these researchers adopted an ACSI model in their case study of the Suzhou rail transit line 1. Yilmaz and Ari [23] conducted a research on the high-speed rail service in Turkey and have shown that there is a negative relationship between user satisfaction and passenger complaints; however, user satisfaction has a positive effect on loyalty. Cao and Chen [74] have proven that the relationship between user satisfaction and complaints and user loyalty is statistically significant, where user satisfaction has a negative and direct effect on user complaints but a positive and direct effect on loyalty. Furthermore, user satisfaction has been predicted to influence user complaint and loyalty in the case of Taiwan High-Speed Rail (THSR) and Korea Train Express (KTX) [21].

Lai and Chen [11] conducted a study in Taiwan which focused on the Kaohsiung Mass Rapid Transit (KMRT); the researchers employed an SEM approach and found that KMRT users' satisfaction has a significant and positive effect on user loyal. This finding is in line with those made by Kuo and Tang [22] in their investigation on the connection between several antecedents, including service quality, corporate image, user satisfaction and behavioral intention, in the case of THSR. This study focused primarily on the demands of elderly users. Chou et al. [43] conducted a study in Taiwan which involved 1235 respondents (THSR's users); the results of the study are similar to those obtained by Lai and Chen [11] and Kuo and Tang [22]. Considering that the three studies were conducted in the same country (Taiwan), the similar respondent characteristics is an indication of consistent findings.

TABLE II  
THE CONSEQUENCE OF SATISFACTION DISCUSSED IN CURRENT LITERATURE

Studies (Year)	Location	Type of transportation	Consequence of user satisfaction			Ref.
			Complaint	Loyalty	Behavioral intention	
Lai & Chen (2011)	Hong Kong	MRT			X	[11]
Shen et al. (2016)	Suzhou, Republic of China	Rail rapid transit		X		[3]
Yilmaz, & Ari (2017)	Eskişehir and Ankara, Turkey	High speed rail	X	X		[23]
Fu et al. (2018)	Suzhou, Republic of China	Public Transport		X		[27]
Rahayu (2018)	Indonesia	Public Bus		X	X	[75]
Irtema et al. (2018)	Malaysia	Public Transport			X	[6]
Putri et al. (2018)	Indonesia	Public Transport		X		[76]
Yi et al. (2018)	Malaysia	Rail Transit		X	X	[77]
Zhang et a. (2019)	China	Public Transport	X	X		[78]
Yuan et al. (2019)	Harbin, China	Public Bus	X	X		[79]
Ha et al. (2019)	Malaysia	Public Transport		X		[80]
Wang et al. (2020)	Tianjin, Republic of China	Urban Rail Transit		X		[81]
Le et al. (2020)	United States of America	Public Transport		X		[82]

#### IV. CONCLUSION

Even though numerous studies have been conducted to investigate the relationship between the antecedents (perceived quality and perceived value) and the consequence (user complaints and loyalty) of user satisfaction in the context of public transport, to the best of the authors' knowledge. This is the first study to provide the evidence and justification through a compilation and review of the literature to support the relationship between these elements. Based on the discussion of the evidence in the previous sections, this study strongly concludes that perceived quality and perceived value have a significant influence on user satisfaction. Furthermore, user satisfaction has been proven to negatively affect user complaints and a positive and direct effect on loyalty. Based on the reviewed literature, it is concluded that the root of this relationship is service quality. Users' perception of quality and value is high in cases where the public transportation authority provides high-quality public transportation service, leading to enhanced user satisfaction and loyalty and reduced user complaints. This study discussed the service attributes that are frequently cited by researchers across the globe. This study has provided useful information for the public transportation authority that may help provide a greater understanding of user demands, thereby facilitating the effort to ensure user's satisfaction with the public transportation service, reduce the number of complaints, and improve loyalty. In addition to benefiting the users, service quality improvement ensures that the public transportation service provider will receive fewer complaints and generate profits by retaining current users and attracting new users.

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