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A Multivariate Model of Ridesharing Service Quality in Bangladesh

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Abstract

Customer Satisfaction and loyalty are critical indicators of the sharing economy's long-term viability, particularly in developing countries. The main objective of this study is to develop a service quality model applicable in the sharing economy based on the ridesharing service perspective. Through synthesizing existing theories and literature, the dynamics of ridesharing service quality (RSSQUAL) have been conceptualized. To verify the study using the PLS-SEM analysis technique, data have been collected in Dhaka from 210 users of ridesharing services through an online questionnaire survey. This study finds that ridesharing service quality is a second- order model, whereby six primary dimensions including service availability, ease of use, empathy, tangibles, security & privacy, and cost constitute the primary dimensions. The study also finds significant relationships among RSSQUAL, service loyalty and customer satisfaction. Theoretically, this study extends the research of sharing economy through proposing the RSSQUAL model in a new research context. Practically, companies can focus on key quality dimensions to better satisfy the customers. Finally, the viability of sharing economy in the developing countries has been assessed through the determination of customer service loyalty and satisfaction.

Key Words: *Sharing Economy, Ridesharing Service, Service Quality Model, Service Loyalty*

1.0 Introduction

The pre-industrialist society was highly involved with agricultural production and sea-food collection whereas the industrialized society focused on secondary production with machines in factories. The post-industrialism era paved the way to adopt an economy that is free from the production of goods rather than focuses on services. Due to rapid globalization, the 21st century has seen the rise of service-providing organizations to meet the needs and demands of customers. Hence, the concept of the 'sharing economy' has boomed. When paired with digital platforms, the emergence of the sharing economy is seen as a threat to established economic practices. One of the most intriguing aspects of this new digitally enabled sharing economy is that it stands at the crossroads of two key technical revolutions: organized sharing and digitalization (Yuana et al., 2019). As a result of this convergence, new avenues for commerce, politics, and social engagement have opened up, many of which are housed within rapidly expanding digital platforms.

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Ridesharing is a phrase used to describe the sharing economy's impact on the transportation industry. Public transportation in different countries has been significantly impacted by ridesharing services in recent years. As such, highway construction in developing countries has always been slower and less extensive than the growth in traffics on the road. As a result, people are using ridesharing services such as Uber, Pathao, Obhai, and Shohoz instead of buying their own automobiles (Sakib & Mia, 2019). The business model promoted by digitally mediated platforms is extensively used by ridesharing businesses. There has been an upsurge in demand for this transportation service model in developed and developing nations since it is sustainable for high levels of community mobility. Because of the immense opportunity of making sustainable cities and communities, several nations are focusing on promoting ridesharing services as an efficient mode of transportation. For instance, ridesharing in China is marketed as a service that will save energy and reduce emissions by reducing people's desire to buy new automobiles (Yu et al., 2017). In San Francisco, ridesharing platforms have been regarded as a positive step toward making the city as "the innovation capital of the planet" (Flores & Rayle, 2017). When it comes to establishing "smart tourist ecosystems" in Australia and Singapore, ridesharing is seen as a crucial component(Tham, 2016).

By reducing traffic bottlenecks and congestions, ridesharing services have a significant impact on economic, environmental, social, and developmental concerns. App-based services have exploded in popularity because of the widespread availability of smartphones and the internet, which makes it easier to locate nearby automobiles in the shortest possible time. It is also possible to use a smartphone app to follow a driver's whereabouts, predicted destination, and to fix fares electronically. It not only eliminates the drudgery of owning and maintaining a private automobile, but also reduces the exhaustion and harassment of public transit. Thus, users perceive the service to be one of the most efficient and user-friendly means of transportation available today.

For businesses, ridesharing has been a profit-generating hub through creating employment for the general mass, reducing carbon emission, and protecting the environment. However, the adoption of ridesharing services is believed to be primarily associated with the perceived quality of ridesharing services. Authors such as Dey et al. (2019), Karim et al. (2020), Ahmed et al. (2021)400 questionnaires were distributed to the respondents online (Google form believe that it is service quality that works as the antecedent of customer adoption of ridesharing services in a developing country like Bangladesh. They argue that service quality works as the prime stimuli that motivate users to use ridesharing service. Hence, this study holds a similar philosophy that service quality is the prime determinant of customer's adoption of ride sharing services and it impacts significantly on customer satisfaction and service loyalty.

There is a significant gap in literatures dealing with the service quality elements that foster the acceptance of ridesharing services. As a result, it is necessary to understand whether customers are satisfied with the existing ridesharing services and how the service quality dimensions are constructing the effect. Conversely, whether existing users are going to use the service in the long run is still under question. Additionally, to what extent customers perceive the service quality dimensions to be valuable for them in a developing country needs to be assessed. Hence, to determine the factors that encompass the service quality of ridesharing, and how these factors contribute to customers' satisfaction and service loyalty, this study purposes to figure out robust answers to the following research questions.

Research Question 1: What are the dimensions that constitute the service quality of ridesharing services in developing countries?

Research Question 2: How service quality of ridesharing is associated with customers' perceived satisfaction, and service loyalty in this context?

2.0 Theoretical Framework

2.1 Service Quality

Quality, according to the Japanese, is characterized as 'zero defects-doing it right the first time' (Parasuraman et al., 1985) whereas Corsby (1979)defines it as 'a compliance with the need'. Zeithaml (1988) defines service quality as the disparity between the expectation and actual perceived service. There are numerous studies to validate the impact of quality on customer satisfaction. As a result, finding out what consumers need, desire, and perceive is critical for the success of any business. Managers must look for areas of concern and devise strategies for addressing them to boost productivity as well as profitability. Therefore, interest in this subject has grown exponentially and academics have begun to investigate the best method of gauging consumerviewpoint.

2.2 SERVQUAL Model

Parasuraman et al. (1985)concentrated on the gaps in the Grönroos's (1984)model and developed a new model of service quality assessment, which is known as the SERVQUAL model (Figure 1). They attempted to recover the deficiencies of the Nordic model by introducing a different approach to assessing service quality. According to the model, the difference between the anticipated level of service and the actual service level should be utilized to measure service quality perception along with five factors: Assurance, Empathy, Reliability, Tangibility, and Responsiveness.

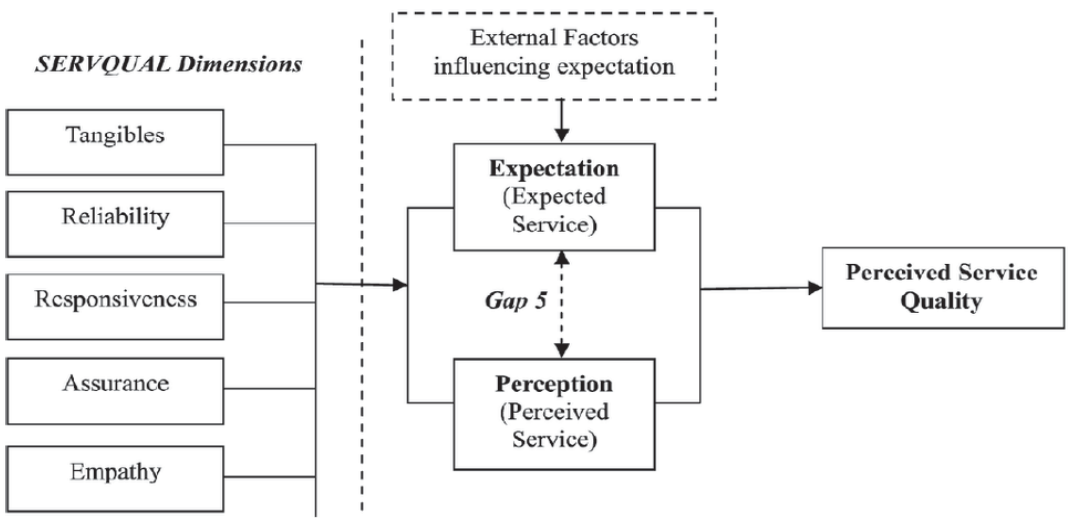

Figure 1:SERVQUAL Model

Source: Parasuraman et al. (1985, 1988)

Even though it is an exploratory study and does not provide a clear assessment method for detecting gaps at different levels, SERVQUAL is the mostly utilized model utilized by researchers in determining the quality of different service sector such as healthcare, transportation, tourism, public recreation centers, banking etc.(Akter, 2012)

2.3 E-S-QUAL Model

Because of the wide adoption of technology and internet-mediated platforms, Parasuraman et al. (2005)proposed the E-S-QUAL model. The SERVQUAL model is mainly associated with offline-based services whereby there are 5 dimensions as mentioned in section 2.2. However, with the emergence of internet-based services, the necessity of a unified online service quality model was required. Site Qual (Yoo & Donthu, 2001), and Web Qual(Barnes &Vidgen, 2002; Loiacono, 2000) were the two widely used models to gain insight into the perceived quality of service of online customers. These models have as many as 12 dimensions and adopt a convenient sampling technique. Therefore, Parasuraman et al. (2005) developed a model which has only 4 dimensions. Also, there are only 22 items associated with these dimensions.

Table 1: E-S-QUAL dimensions

Dimensions	**Definition**
System Availability	This relates to the accuracy of site's technical performance.
Efficiency	The site's speed and ease of use.
Fulfillment	The degree to which the site ensures item availability and order delivery.
Privacy	The extent to which the site ensures safety.

Source: Parasuraman et al. (2005)

2.4 Technology Acceptance Model (TAM)

Davis (1985, 1989) developed TAM which is one of the most well-known and extensively applied models for analyzing the acceptability and adoption of innovation, information systems, and technologies, which has been the topic of countless research after its introduction. This model is an adjustment of Fishbein & Ajzen's (1975) theory of reasoned action (TRA) which has been effective in anticipating and describing actions around a variety of different situations. TAM has now become the leading paradigm for examining the factors influencing consumers' adoption of technology(King & He, 2006).

Perceived usefulness and perceived ease of use are the two most important factors in TAM. Perceived usefulness refers to the extent to which an individual feels that adopting a certain system will improve his or her performance at work. On the other hand, perceived usefulness means to what degree a user believes that it is effortless to utilize a given system (Davis, 1989). As per TRA, these perceived dimensions should impact the intensions in the use of a system. In addition, it is considered that perceived usefulness is influenced by perceived ease of use. The consideration is justified by the notion of improving the usability of a system through saved energy.

Over the years, the TAM has garnered tremendous support. It was verified over a multitude of platforms and perceived ease of use and perceived usefulness have been justified as dependable and meaningful rational aspects. (Burton-Jones & Hubona, 2006). It has been acknowledged that the model can determine 30-40% of a technology's usage(Legris et al., 2003). Moreover, it is commonly observed that perceived usefulness is the main predictor in the model.

2.5 Major Studies of Ridesharing Services and Literature Gaps

Several studies have been conducted in different developed and developing countries of the world determining several quality dimensions of ridesharing service. As shown in table 2 most of the studies have concentrated on generic service quality dynamics. Additionally, these studies are mostly associated with determining the impact on customer satisfaction. Shah (2020) identified the dimensions but the study requires further justification in terms of customer satisfaction and service loyalty. In their study, Dey et al. (2019) measured customer satisfaction using the standardized SERVQUAL dimensions. Also, the sample pool is not adequate.

Alonso et al.'s (2018) work in Spain focused on offline taxi services and the dimensions are not well-enough to measure online-based ridesharing services. In their work, Abd Elmeguid et al. (2018) presented the factors that affect customer satisfaction but didn't focus on service quality solely. Karim et al. (2020) focused on theTAM model and determined the role of perceived trust, usefulness, and usability but the study didn't assess the quality dynamics of ridesharing services. The study finds that there is a paucity of literature relating to ridesharing services in developing countries, especially in Bangladesh. Therefore, the study successfully synthesizes existing theories, works, and literature of previous researchers and develops a conceptual framework based on which the overall study will be conducted.

Table 2: Previous Studies of Ridesharing Service Quality

No.	Authors	Focus of Study	Sample&Country	Variables	Findings
1	Abd Elmeguid et al. (2018)	To examine the factors that affects customer satisfaction in sharing economy	520 respondents in Alexandria, Egypt	Knowledge, cost saving, security, service quality, and technological factors.	All the variables have significant positive relationship other than the factor 'cost saving'
2	Alonso et al. (2018)	To model the user perceived quality dynamics of offline taxi services.	215 respondents in Spain	Fare, waiting time, journey time, information, payment, signage for taxi ranks, location, comfort, quality of vehicle, behavior of driver, safety etc.	Waiting time along with journey time are the most important factors. Also, accessibility, comfort, and safety are influencing dimensions. However, fare is not that much important in the adoption of taxi services in Spain.
3	Dey et al. (2019)	To measure the relationship between service quality and customer satisfaction	175 respondents in Bangladesh	SERVQUAL model's five dimensions i.e., tangibility, reliability, empathy, responsiveness, assurance	Empathy, responsiveness, and tangibility have positive impact on customer satisfaction whereas assurance and reliability have no significant influence.
4	Kuswanto et al. (2019)	To demonstrate service quality's effect on loyalty, satisfaction, and trust.	507 respondents from Indonesia	Offline services include SERVQUAL dimensions and online service include system, service, and information quality	Both the online and offline service quality dimensions have positive relationship with trust, satisfaction, and loyalty.

5	Wang et al. (2019)	To investigate the influence of perceived risk and value in making non-users to potential users.	378 respondents in China	Perceived value is a second order construct consisting of hedonic, social and utilitarian values whereas perceived risk consists of privacy, security, conflict, and performance risks.	Perceived value is positively related to customer's willingness to use ridesharing service. But perceived risk is negatively related.
6	Karim et al. (2020)	To portray the behavioral intention of using ride-hailing services in Bangladesh.	250 respondents in Dhaka, Bangladesh	An extended TAM model having three dimensions namely, perceived usability, perceived usefulness, and perceived trust.	Perceived usefulness is positively associated with satisfaction and behavioral intention, but perceived usability and perceived trust's relationship is not statistically significant.
7	Shah (2020)	To determine the factors affecting ridesharing service quality in India	684 respondents in India	Internal environment, mobile security and privacy, mobile availability and efficiency, Mobile convenience and reliability, safety and personnel, comfort, mobile customer service and billing	The study results into the identification of variables to determine service quality of ridesharing service in the Indian context. Also, the authors estimate that the model can be used in other countries with similar cultural setting.
8	Ahmed et al. (2021)	To investigate customer's perception of ridesharing service in Bangladesh	281 respondents in Bangladesh	Perceived quality and value for money	Perceived value for money and perceived quality both have significant positive relationship with customer satisfaction.

2.6 Conceptual Framework

Ridesharing services are mixtures of both online and offline services. The app-mediated platform of hailing vehicles (bike or car) necessarily requires a set of quality dynamics that fulfills all the challenges of both the services. For app-mediated services, there are several dimensions that constitute the overall service quality. This study proposes system availability and ease of use as the service quality dynamics of app-based services. The other challenges of ridesharing services include tangibles, empathy, security, and cost. So, this study takes into consideration the mentioned dynamics as the service quality dimensions of ridesharing services in the context of developing countries.

System availability has been defined by Parasuraman et al. (2005) as the accuracy of any site's technical performance. This study defines system availability as the extent to which the ride sharing websites/applications provide access to the service without any failure at anywhere and anytime. Silalahi et al. (2017) stresses that service availability is one of the most important dimensions that cause pillions to use ridesharing services.

Ease of use is referred to how a customer can easily use a particular system or service Salameh & Hassan (2015). This study defines ease of use as the degree to comfort a customer experience while using the options of ridesharing apps. It is true that the less complexity a customer faces in using an app, the more intended the customer becomes to use the app. For ridesharing services, it is obvious that app options should be easy enough to understand and operate.

The SERVQUAL model of Parasuraman et al. (1985, 1988) defines tangibles as the physical facilities, personnel, equipment, and communication material associated with the delivery of

services. Several authors such as Dey et al. (2019), Kuswanto et al. (2019), Lim et al. (2021) propose that tangibles of ridesharing services include the condition, ambient, and cleanliness of the vehicle. In ridesharing service quality, tangibles is a prime dimension of service quality since it is associated with the esteem of a particular user (Lim et al., 2021).

Parasuraman et al. (1988) define empathy as the caring attention, polite behavior, and customer focus of the service provider. As service cannot be tested or used before it is provided, empathy should be ensured first to ensure that the concerned customer gets a good feeling about the overall service (Akter, 2012). Ridesharing services require unwavering attention to customer needs and demands (Dey et al., 2019; Kuswanto et al., 2019; Lim et al., 2021). Customers expect that their driver/rider should show courtesy, politeness, and caring attention to them (Hoque & Saumi, 2021). Therefore, it is an important component of ridesharing service quality.

Akter's (2012) work on mHealth provides the ground to believe that customers of developing countries take outcome quality into serious consideration while using a particular service or deciding to continue using that service. Hence, cost can be considered as the outcome benefit of ridesharing service. Alonso et al. (2018) stress that the relative cost advantage of ridesharing service in comparison to other services would make ridesharing a popular transportation service in the world. This study considers fairness, affordability, and cheapness of fare as the variables of cost that positively affect the adoption of RSS in Bangladesh.

Several authors including Hoque & Saumi (2021), and Shah (2020) believe that security and privacy concerns significantly affect the adoption of RSS. This study holds a similar philosophy and takes into consideration that the personal information, financial transaction information, and usage behavior of any customer are seriously protected and not shared with any other parties. Hoque & Saumi (2021) argues that without the protection of security and privacy, customers would not be interested to use RSS. Hence, the abovementioned discussion influences the study to define the following hypotheses:

H1a: System availability is a first order dimension of ridesharing service quality
H1b: Ease of use is a first order dimension of ridesharing service quality
H1c: Tangibles is a first order dimension of ridesharing service quality H1d: Empathy is a first order dimension of ridesharing service quality H1e: Cost is a first order dimension of ridesharing service quality
H1f: Security and privacy is a first order dimension of ridesharing service quality

All the major studies mentioned in table 2 show that there is ample evidence to believe that service quality has a positive relationship with customer satisfaction and customer loyalty. In a study by Hussain et al. (2015) in Dubai airline services, it is found that passenger satisfaction is strongly influenced by the quality of the perceived service. Hapsari et al. (2016) conducted a similar study and uncovered a clear association between satisfaction and service quality in Indonesia. Also, Miranda et al.'s(2018) work on passengers in Portugal resulted in similar findings. In his book, Aaker (2009) states that the brand impression of quality offers several advantages. When a

company's products are of superior quality, people are more likely to purchase the brand, which in turn allows it to command a higher price point and differentiate itself from the competition. So, the last three hypotheses of this study are:

H2: RSSQUAL positively affects customer satisfaction.

H3: RSSQUAL positively affects service loyalty.

H4: Customer satisfaction positively affects service loyalty.

H5: Customer satisfaction positively mediates the relationship between RSSQUAL and service loyalty.

Figure 2 illustrates the conceptual framework of this study:

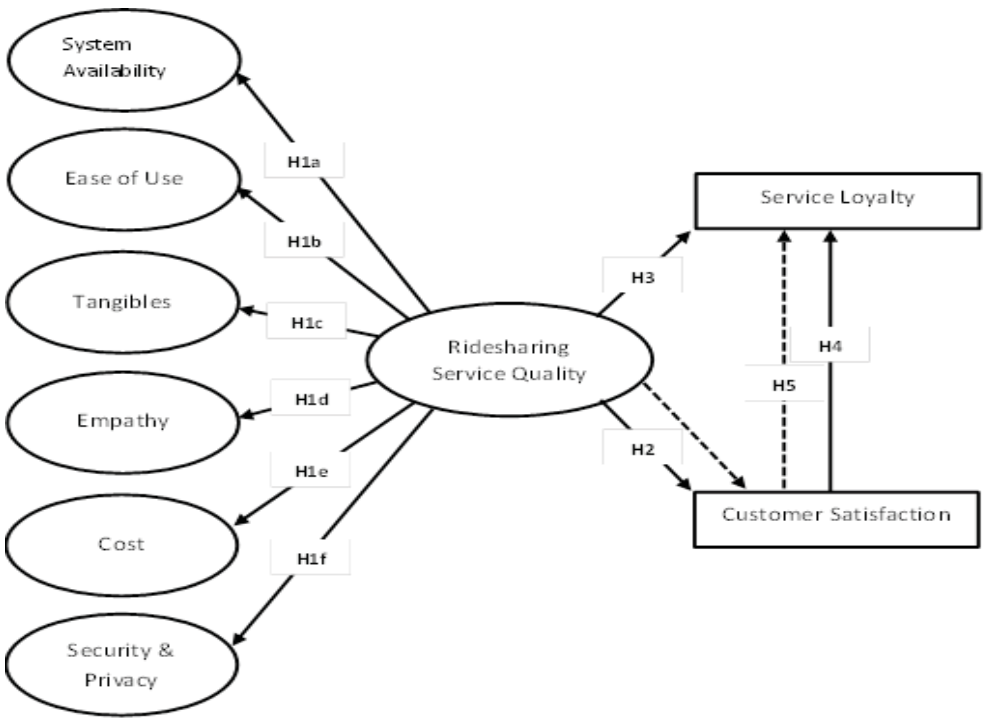

Figure 1: Conceptual Framework

3.0 Methodology

This study follows an **Explanatory Research Design**. Explanatory research is a type of study that establishes a causal relationship between independent and dependent variables (Saunders et al., 2016). This study describes the causal relationship between customer satisfaction and service quality; service quality and service loyalty; customer satisfaction and service loyalty. It seeks explanatory answers to 'How' or 'Why' questions related to the existing associations. With a **positivist** philosophy, the conceptual framework of this study has been developed through synthesizing existing theories and literature. Therefore, this study follows a **deductive approach** to theory development.

Furthermore, quantitative data have been collected from the respondents using a five-point Likert scale. Respondents were asked to rate the statements whereby strongly disagree was rated 1 and strongly agree got 5. Hence, it can be said that the methodological choice of this study is a **mono method quantitative study**.

3.1 Measurement Items

Inductive and deductive are the two most used approaches to item generation. According to Zikmund et al. (2013), the deductive approach is used when there are sufficient well-established items to measure any specific dimension. Likewise, the inductive approach is used when the meaning of any construct is hard to understand or yet to establish by theories. Since this study is a deductive one, it has taken items from several literatures as well as theories and built the ground to measure the quality dimensions. As table 3 shows, at least three items have been extracted to measure any specific dimension.

Table 3: Items to measure service quality of RSS

Service Quality Dimensions	Items	Sources
System Availability	01. Accessible any time. 02. App launches and runs smoothly. 03. Does not freeze/crash.	Parasuraman et al. (2005); Huang et al. (2015); Silalahi et al. (2017)
Ease of Use	04. Easy options to understand/use. 05. Ease of Navigation/GPS tracking 06. Ease of contacting the driver	Salameh & Hassan (2015); Silalahi et al. (2017); Karim et al. (2020)
Tangibles	07. Vehicle Conditions (visual appealing) 08. Cleanliness 09. Enough Space	Parasuraman et al. (1985); Dey et al. (2019); Kuswanto et al. (2019); Hoque & Saumi, (2021); Lim et al. (2021)
Empathy	10. Careful attention of driver 11. Polite and Gentle behavior of drivers 12. Feedback of delivered service	Dey et al. (2019); Kuswanto et al. (2019); Lim et al. (2021);
Cost	13. Fairness in fare 14. Economical and not expensive 15. Affordable	Alonso et al. (2018); Hoque & Saumi (2021)
Security & Privacy	16. Security of financial transaction. 17. Protection of personal information and no disclosure of information with other parties. 18. Protection of information about usage behavior.	Hoque & Saumi (2021); Shah (2020)

3.2 Data Collection

Data have been collected from an online questionnaire survey using a google form. As there is no sampling frame available, this study unearthed responses using a **snowball sampling**

technique. Prior to the collection of data from the general mass, the questionnaire was sent to 30 graduate students at the University of Dhaka to measure the coherence, variance, and reliability of questionnaire items. Based on their provided feedback, the questionnaire was simplified accordingly. This pilot study of pretesting the questionnaire on 30 graduate students has been conducted based on the work of Wang et al. (2019).

The overall study covers responses from **210 respondents.** Table 4 summarizes the demographic characteristics of respondents. In this study, 66% of the total respondents are male whereas 34% are female. Majority of the users are students (44.8%) whereby responses have been gathered from other occupational backgrounds such as business, private organizations, teaching/research, and govt. jobs. It covers responses from all the age categories as shown in table 4. However, respondents seem to be young as the majority of them belong to the age category of 18 to 25.

Table 4: Respondent's Demographic Profile

Items	Categories	Percentage (%)
Gender	Male	66
	Female	34
Age	18-25	40.4
	26-33	24.7
	34-41	18.2
	42-49	11.9
	50+	4.7
Occupation	Business	11.9
	Private Organization	19
	Student	44.8
	Teaching/Research	5.7
	Govt. Services	18.6

4.0 Analysis

4.1 Measurement Model

Before analysing the overall model, all the constructs are examined through the lens of construct reliability and validity. Composite reliability and Cronbach's Alpha are measured to ensure that items generate consistent results of the service quality dimensions. Table 5 shows that the Cronbach's Alpha value of all the constructs between 0.807 to 0.915 that are better than the suggested value of 0.70. The composite reliability estimates show that all the constructs are highly reliable as these are higher than the cutoff value of 0.70 and range between 0.886 to 0.946. These data demonstrate that the measurement indicators for each construct have high internal consistency and that the measurement model is repeatable and dependable.

Table 5: Measurements of the constructs

Constructs	Items	Factor Loadings	Composite Reliability	Cronbach's Alpha	AVE
System Availability	SA1	0.881	0.919	0.868	0.791
	SA2	0.902			
	SA3	0.885			
Ease of Use	EU1	0.841	0.894	0.822	0.737
	EU2	0.865			
	EU3	0.870			
Tangibles	TA1	0.830	0.886	0.807	0.723
	TA2	0.904			
	TA3	0.813			
Empathy	EM1	0.875	0.895	0.824	0.739
	EM2	0.859			
	EM3	0.845			
Cost	CO1	0.929	0.946	0.915	0.855
	CO2	0.935			
	CO3	0.909			
Security and Privacy	SP1	0.874	0.913	0.858	0.779
	SP2	0.872			
	SP3	0.900			
Customer Satisfaction	ST1	0.858	0.912	0.855	0.775
	ST2	0.884			
	ST3	0.899			
Service Loyalty	SL1	0.866	0.907	0.846	0.764
	SL2	0.874			
	SL3	0.882			

Discriminant validity and convergent validity are the two most important analysis of verifying whether measuring items effectively reflect the corresponding measured constructs. This study measures the AVE (average variance extracted) to ensure convergent validity. Table 5 shows that the AVE of the constructs fall between 0.723 to 0.855 that are higher than the recommended value of 0.50. As demonstrated in table 6, all the factor loadings are greater than the suggested value of 0.70. Also, through the cross-loading analysis, it is found that all the factor loadings have exceeded the value of cross-loadings which means that the items are valid and appropriate to measure the dimensions.

Table 6: Cross-loading Analysis

	System Availability	Ease of Use	Tangibles	Empathy	Cost	Security & Privacy	Satisfaction	Service Loyalty
SA1	**0.881**	0.198	0.106	0.197	0.219	0.202	0.249	0.228
SA2	**0.902**	0.215	0.202	0.187	0.205	0.206	0.286	0.214
SA3	**0.885**	0.205	0.128	0.170	0.149	0.262	0.224	0.1410
EU1	0.235	**0.841**	0.119	0.134	0.152	0.231	0.235	0.238
EU2	0.150	**0.865**	0.176	0.156	0.198	0.191	0.243	0.263
EU3	0.211	**0.870**	0.244	0.200	0.251	0.200	0.287	0.336
TA1	0.140	0.223	**0.830**	0.061	0.158	0.256	0.284	0.263
TA2	0.119	0.150	**0.904**	0.129	0.228	0.217	0.244	0.294
TA3	0.165	0.169	**0.813**	0.066	0.193	0.155	0.124	0.228
EM1	0.233	0.136	0.152	**0.875**	0.142	0.126	0.194	0.179
EM2	0.214	0.162	0.049	**0.859**	0.161	0.093	0.201	0.141
EM3	0.078	0.202	0.054	**0.845**	0.205	0.068	0.180	0.173
CO1	0.171	0.232	0.210	0.177	**0.929**	0.239	0.301	0.257
CO2	0.232	0.210	0.226	0.180	**0.935**	0.220	0.329	0.285
CO3	0.194	0.213	0.194	0.185	**0.909**	0.187	0.333	0.260
SP1	0.200	0.210	0.212	0.071	0.215	**0.874**	0.31	0.318
SP2	0.195	0.177	0.217	0.154	0.165	**0.872**	0.262	0.301
SP3	0.265	0.248	0.227	0.076	0.236	**0.900**	0.405	0.339
ST1	0.254	0.237	0.224	0.181	0.300	0.326	**0.858**	0.513
ST2	0.274	0.225	0.232	0.143	0.254	0.336	**0.884**	0.519
ST3	0.228	0.318	0.229	0.258	0.356	0.321	**0.899**	0.600
SL1	0.150	0.240	0.266	0.208	0.271	0.326	0.555	**0.866**
SL2	0.229	0.270	0.221	0.102	0.292	0.312	0.519	**0.874**
SL3	0.195	0.347	0.320	0.190	0.199	0.313	0.552	**0.882**

Table 7 shows the correlation among variables of the model. It is highly suggested that the correlation among constructs should not exceed the 0.85 threshold. In this model, all the correlations are below the established criteria and fall between the range of 0.109 to 0.619. However, all the correlations are statistically significant except the relationship of tangibility - empathy, and security & privacy – empathy. As shown in table 5.6, the highest value of the square root of all the constructs is 0.925 whereby the lowest value is 0.858. In this model, the correlations between a construct and other constructs are lower than the square root of the Average Variance Extracted. Therefore, it can be said that the discriminant validity and convergent validity are satisfactory and fulfils all the requirements to measure the constructs of our research model.

Table 7: Squared root of AVE and correlations among the variables

	SA	EU	TA	EM	CO	SP	ST	SL
SA	**.889**							
EU	.232**	**.858**						
TA	.162**	.204**	**.850**					
EM	.199**	.190**	.100	**.860**				
CO	.213**	.230**	.228**	.198**	**.925**			
SP	.251**	.242**	.248**	.109	.234**	**.883**		
ST	.284**	.293**	.260**	.221**	.345**	.370**	**.880**	
SL	.216**	.322**	.310**	.193**	.289**	.362**	.619**	**.874**

**. Correlation is significant at the 0.01 level (2-tailed).

4.2 Structural Model

Figure 3demonstrates the path coefficients of all the constructs in the RSSQUAL model. It is found that, all the p values of the constructs are less than .001 meaning that all the paths are statistically significant, and all the hypotheses of this study are accepted at $p < .001$. The R^2value of Ridesharing service quality and satisfaction is .70 which means ridesharing service quality can explain as much as 70% of the variance of customer satisfaction. Also, the model confirms that ridesharing service quality can explain 67% of the variance of customer loyalty.

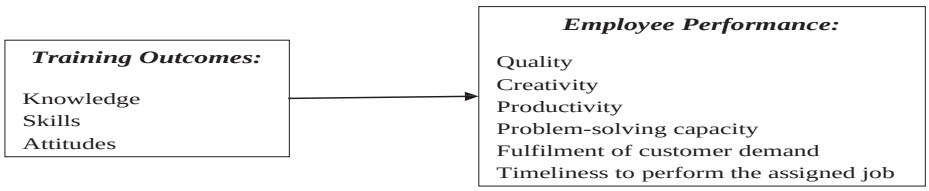

Figure 1: Theoretical Framework of the Study

Figure 2: PLS-SEM Analysis of the Model (*** $p < .001$)

4.3 Hypothesis Testing

The first hypothesis is related to measure the 1st order constructs of ridesharing service quality. Table 8 confirms that all the dimensions i.e., system availability, security and privacy, ease of use, empathy, tangibles, and cost are significant components of ridesharing service quality. Hence, all the hypothesis from H1a to H1f are accepted. Also, ridesharing service quality positively affects customer satisfaction (β= 0.839, t-value = 6.167, $p < .001$) and service loyalty (β= 0.818, t-value = 5.971, $p < .001$) supporting hypotheses H2 and H3. Finally, this study shows that customer satisfaction positively affects service loyalty (β=0.729, t-value = 9.182, $p < .001$) which supports hypothesis H4.

Table 8: Hypotheses testing results

Path	B	t-value	Hypothesis	
System Availability → RS service quality	0.404	4.138	H1a	Accepted at p < 0.001
Ease of Use → RS service quality	0.484	4.559	H1b	Accepted at p < 0.001
Tangibles → RS service quality	0.409	4.012	H1c	Accepted at p < 0.001
Empathy → RS service quality	0.333	3.475	H1d	Accepted at p < 0.001
Cost → RS service quality	0.470	4.700	H1e	Accepted at p < 0.001
Security & Privacy → RS service quality	0.541	4.138	H1f	Accepted at p < 0.001
RS service quality → Customer Satisfaction	0.839	6.167	H2	Accepted at p < 0.001
RS service quality → Service Loyalty	0.818	5.971	H3	Accepted at p < 0.001
Customer Satisfaction→ Service Loyalty	0.729	9.182	H4	Accepted at p < 0.001

4.4 Model Fit Indices

The cutoff values and extracted value of the model are shown in table 9. To get a good model fit, all the indices are expected to fulfill the recommended criteria. It is found that the model's CMIN/DF (chi-square fit statistics/degree of freedom) is 1.104 which is below the edge of 5 meaning that the model has a good fit. Similarly, RMSEA of this model is 0.022 which is lower than the suggested value of 0.08. The GFI, CFI, AGFI, TLI, NFI, and IFI indices are also higher than the recommended value of 0.90. Therefore, it can be said that the model shown in figure 4 has a good fit and the research model and can be generalized with sufficient confidence.

Table 9: Model fit results

Fit Indices	Recommended Value	Extracted Value
GFI	≥ 0.90	0.940
CFI	≥ 0.90	0.990
NFI	≥ 0.90	0.904
AGFI	≥ 0.90	0.914
TLI	≥ 0.90	0.989
IFI	≥ 0.90	0.990
RMSEA	≤ 0.08	0.022

4.5 Analysis of Mediating Effect

Before analysing the mediation effect of customer satisfaction between ridesharing service quality and service loyalty, the study fulfils the priori criteria. Firstly, the predictor (RSSQUAL) influences the mediator (Satisfaction); secondly, the mediator has a significant relationship

with the criterion variable (Service Loyalty); and finally, the predictor, without the presence of mediator influences the criterion variable. This study finds that the total effect (direct and indirect) of RSSQUAL and service loyalty is 0.899 whereby the indirect effect explains 34% ($p < 0.05$) of the total effect. This finding supports H5 which means that ridesharing service quality has an indirect impact on service loyalty through the meditation of customer satisfaction. Since the relationship between service quality and loyalty is still significant ($p < 0.05$) in the presence of mediator (satisfaction), it can be said that satisfaction partially mediates the relationship between RSSQUAL and Loyalty.

Table 10: Hypothesis testing in mediation analysis

Path	B	t-value		Hypothesis
RS service quality → Customer Satisfaction → Customer Loyalty	0.349	2.391	H5	Accepted at $p < 0.05$

5.0 Discussion

The first objective of this study was to develop a ridesharing service quality model in the context of developing countries. Through synthesizing the existing literature, the study has found that there are many dimensions relevant to RSSQUAL. However, the study has defined six dimensions such as tangibles, empathy, security and privacy, system availability, cost, and ease of use that constitute the overall quality that creates customer satisfaction and works as the building block of service loyalty. Therefore, the first six dimensions are brought under hypotheses H1a to H1f.

After analyzing factor loadings, cross-factor loading, reliability, and validity, the study develops a model based on data gathered from an online questionnaire survey. The model confirms that all the six dimensions are the formative first -order construct of RSSQUAL. This study finds that there are significant relationships ($p < .001$) among all the six dimensions and confirms that RSSQUAL is a second order model. As figure 3 shows, security and privacy is closely associated as a first order construct of RSSQUAL. On the other hand, system availability, ease of use, tangibles, cost have almost similar regression weights. However, empathy stands at the last position as a first order construct of RSSQUAL although the relationship is statistically significant.

In Bangladesh, people who consider ridesharing service as convenient, user -friendly, and efficient mode of transportation usually use this online-based platform. Thus, users of this service are expected to be mostly tech-savvy. This study includes users who have been using ridesharing service for less than 1 year to more than 4 years. So, the responses related to customer satisfaction and customer loyalty can be generalized to the common users. This study finds that there is a significant relationship between RSSQUAL and Customer Satisfaction. Also, the study shows that RSSQUAL significantly affects service loyalty. As expected, customer satisfaction has a significant positive relationship with service loyalty. This implies that customers who are satisfied would like to continue using ridesharing service for a long time. RSSQUAL not only directly affects customer service loyalty but also indirectly impacts through the mediation of customer satisfaction.

The main objective of this study was to develop a user -perceived service quality model of ridesharing service in the context of developing countries. All the model fit indices (CMIN/DF= 1.104; RMSEA=0.022) ensure that the model has a good fit. Thus, the model which is the outcome of this study can be generalized in the context of all the developing countries. The model is a combined form of SERVQUAL, E-S-QUAL, MSQUAL and many other literatures and models. Likewise, using structural equation modeling to establish a second order model of service quality in the transportation sector of sharing economy has made this study an information-rich, valid, and crucial one.

6.0 Theoretical and Practical Implications

This study contributes theoretically, methodologically, and practically to the existing quality theories of ridesharing services. Theoretically, the study has contributed by developing a model specifying the dimensions (tangibles, cost, security and privacy, cost, empathy, and system availability) that contribute to the formation of service quality in the sharing economy. The model can be generalized to understand the relationship between service quality, service loyalty, and customer satisfaction. The study has not overlooked the existing theories, rather has formed a new model based on dimensions that can predict 70% of customer satisfaction and 67% of customer loyalty. The study shows novelty in sharing economy research by analyzing the impact of service quality on service loyalty. Hence, the study optimizes that sharing economy is going to sustain in developing countries.

The theory is also unique in that it uses the logical evidence of users' perspectives to measure the service quality of a new internet-mediated economy in a developing country. This study uses the PLS method to establish the RSSQUAL theory. Methodologically, this is one of the very few studies in developing countries to establish a model using partial least square regression method. This study verifies that notion that PLS is capable of effectively dealing with all the restrictions that arise during the development and authentication of a complicated model by proposing strong solutions.

Practically, the study has many implications. First, the study has extracted the user's perspective of ridesharing service quality. The dimensions that users consider while adopting ridesharing service has been revealed. This would help service providers to focus on the key aspects of their business. Second, the current condition of sharing economy in developing countries has been assessed. This reveals that the market of ridesharing service is going to flourish soon. Third, as ridesharing service has become one of the most important parts of the sharing economy, it is imperative to assess whether the service is going to sustain in the context of developing countries or not. This study has uncovered user's intention to continue using the service and found that ridesharing service and other mode of internet-mediated sharing economy is expected to sustain in developing countries. Finally, ridesharing service providers would be overwhelmed to get assistance through this study to formulate policies that would satisfy users while using their service. The abovementioned discussion is well-enough to assume that this study contributes significantly to theories, methodologies, and practices of ridesharing services in developing countries.

7.0 Limitations and Future Research Directions

The study has inferred a service quality model of the sharing economy in the context of developing countries. However, it is not above limitations. The limitations will pave the way for future research agenda. First, the study is conducted using only 210 research samples using snowball and judgmental sampling techniques. The study can be conducted using a large pool of samples using stratified/random sampling technique and following a definite sampling frame. Second, the study was a cross- sectional one to generalize a model. Therefore, the study can be conducted using a longitudinal time horizon to assess the change in consumer behavior and satisfaction. Third, the study can be conducted using samples from both developing and developed countries to assess the model from a cross-cultural setting. Since there is always a difference between samples of developing and developed countries with regards to education, lifestyle, choice, and other demographic data, the study would be a very effective one. Fourth, future studies can extend the research by adding 'outcome quality' as a construct and suggesting a third order model of RSSQUAL. Finally, the study covers only ridesharing service perspectives to gain an insight into the sharing economy. Other perspectives such as house sharing, coworking, food sharing, crowd funding should be included to get the absolute quality model of sharing economy.

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