Customers' Expectations Meet Perceptions or Not: App-Based Ride-Sharing Services by Uber and Pathao in Dhaka City

Mollika Ghosh[*]

Abstract

Since 2016, revolutionary change in transport has occurred in Bangladesh especially by Uber and Pathao app-based ride-sharing services mainly in Dhaka city for convenience seekers. The main purpose of this study is, if customers' expectations of ride-sharing services matched or not with perceived services in Dhaka city. Both quantitative and qualitative methods are utilized, face-to-face and online questionnaires are used during the months of August-November 2018 adopting SERVQUAL dimensions comparing satisfaction of two prominent ride-sharing provider- Uber and Pathao; among 216 respondents. Employing SPSS-25.0; reliability test, exploratory factor analysis (EFA) and service gap score were identified. Based on analysis, separately three factors influence two ride-sharing customers' perceptions, Pathao commuters are satisfied with a significant rate whereas Uber fails to meet commuters perceptions based on SERVQUAL dimensions and tangibility and assurance significantly affect on both service providers customer satisfaction. The study will be helpful for ride-sharing service providers' ability to fulfill commuters' expectation, and also improving influential factors proactively in this saturated marketplace.

Keywords: Customer Satisfaction, Service Quality, Ride-sharing services, Uber, Pathao.

Introduction

Ranking 8th in the list of most populous countries globally and having 17 crore population, Dhaka megacity has 2 crore residents in 2018 resulted by rising income, industry existence and mass migration posing challenge for government ensuring adequate quality service transportation (Akhter, 2018). Total 3.2 million working hours are lost daily because of traffic congestion (Mamun, 2017). Thus, it is high time to understand commuters' expectations and perceptions of transportation quality so they get satisfied service from these organizations (Hosru & Yeboah, 2015). However, private taxi services are perceived positively but somehow controversial among users as these cost high (Akhter, 2018). 4G internet facilities introduced by government initiated smartphone app-based ride-hailing services, facilitating passengers by asking a car or bike to pick-up and drop-off instantly at desired location (Mahapatra & Telukoti, 2018; Kamal, 2018). Specifically, 'E-hailing' means process of calling a motor-vehicle by any device having internet (Hassan, 2017). Inhabitants of Dhaka city now have wide-range of options to choose wisely their regular rides than convincing a CNG-auto rickshaw or a private taxi-cab (Mahapatra & Telukoti, 2018). However, for better quality experience, user-friendly application and 24/7 hour availability they call Uber, Pathao and other e-hailing app-based ride sharing services within a click; therefore

---

[*]Lecturer of Marketing, School of Business, Bangladesh Open University.

these service operators and government must be clear regarding this 2 lakh commuters' perceptions in-turns meeting expectation.

Research Objectives

The main purpose of this study is to examine whether customers expectation meet perception or not regarding app-based ride-sharing services offered by Uber and Pathao in Dhaka city. The specific objectives of this study are:
1. To identify factors influencing passengers satisfaction with the Uber and Pathao services in Dhaka city.
2. To compare between Uber and Pathao regarding their service quality and customer satisfaction.
3. To recommend for minimizing passengers dissatisfaction with the Uber and Pathao services in Dhaka.

Significance of the Study

This research bridges the gap of ride-sharing passengers' satisfaction with SERVQUAL dimensions focusing Dhaka city regarding most prominent app-based ride-sharing service provider, Uber and Pathao which is overlooked previously. No research however, has examined SERVQUAL model with ride-sharing commuters' satisfaction comparing two app-based ride-sharing service provider. Thus this study contributes theoretically and contextually using statistical analysis of comparison by exploratory factor analysis and gap of customers perceived e-hailing service relating expectations in Bangladesh firstly. Along with the ride-sharing service providers, the policy makers and convenient seekers in modern transport service providers can be benefitted by the findings of this study.

Literature Review

Ride-sharing services in Bangladesh
18 million inhabitants' option-stagnated transport arena ineffectively encounter 40,000 CNG auto-rickshaws and 4 lakh rickshaws per day where, ride-share operations transform transport sector (Kamal, 2018; Sadat, 2018). Meeting local needs in economic dynamism ensure, e-hailing services expansion (Kamal, 2018). This service is not a 'magic-bullet' to resolve traffic gridlocks but 'middle-class urban solution' to serve wide mass (Hassan, 2017). A global survey indicates, a private car is used for owners consumption only 4% of the time averaging 50-60 rides a month while rest of the time it's unused in the garage (Ahmed 2018). The ride-share market in Dhaka estimated 2 lakh and occupied 23% market share in transport services in a year signaling rapid expansion in Dhaka; Uber-Pathao contributing most among these (Sadat, 2018). The app-based ride-sharing services mainly Uber and Pathao are two playmakers that are transforming Dhaka city's regular transport sectors. Kamal and Ahsan (2018) pointed that the market currently these services are operating will flourish more. More than 18 million population and 4,2% growth rate increases Dhaka city's worst living standard and according to the recent global report published in

several news portal it is found that this is the second worst city to live in (https://thefinancialexpress.com, 2018).

The ride-sharing service organizations are not like conventional transport sectors like buses, trucks, cars and other vehicles. In this arena the drivers perform as a participant of an income-generating platform (Kamal & Ahsan, 2018). The unutilized time is effectively used by these kinds of convenient app-based services. The ride-sharing services effectively utilize these cars and motorbikes as well as initiate the extra earning facilities for trained drivers and bikers. Many commuters in Dhaka city who regularly face transport sectors frustrations to move office, universities or desired destination; term these services as 'middle-class urban solution' (Hassan, 2017). CNG auto-rickshaws most often refuse to take passengers and if they accept to move they ask for expensive and unpredictable fare whereas, app-based ride sharing services offer cheap-fare convenience, benefits, safety and feedback in only few clicks on the smart phones (Mamun, 2017).

Pathao got much appreciation by local people in Dhaka city as this ride-sharing service firm indigenously recognize the cost-sensitive inhabitants difficulties, empathetic response system and initiating bike-sharing facilities carefully where a significant number of millennials and adults are dependent on this vehicle. The option-stagnated transport sector got relief after the huge availability of app based ride-sharing services because 18 million inhabitants of Dhaka only have the options to utilize 5,000 buses and 40,000 CNG auto-rickshaws without comfort of seats and safety (Akhter, 2018). These gaps are fulfilled mostly by present two competitors of ride-sharing sector.

A recent research explored a car owner spends Tk. 900 per trip whereas a ride-sharing car that utilizes its useless time spends Tk.300 per trip after maintaining fuel and other costs (Elius, 2018). Moreover, CNG auto-rickshaw commuters spend minimum Tk.250 per trip whereas ride-sharing bike rider spends less than Tk. 150 per trip (Elius, 2018; Mamun, 2017). But, in all these cases except the app-based ride-sharing services commuters are unable to get comfort, safety and cost-efficiency. In the context of owner's perspective of regarding car or bike or drivers, Uber and Pathao have generated visible favorable benefits. The drivers, bike riders and car owners earn Tk. 60,000 per month comparing CNG auto-rickshaw owner's income Tk. 45,000 per month and one interesting findings is that average income of Dhaka city dwellers is Tk. 30,000 per month, (Mamun, 2017). This reveals the attractive assured average earning is 50% better in app-based ride-sharing services than other sectors.

Ride-hailing services in Bangladesh got acceptance within last 2 years after San-Fransisco-based Uber launched in Dhaka on 22 November, 2016 operating 633 cities globally with fastest growth in Asia extending 24/7 hour availability within two weeks (Hassan, 2017). Pathao is indigenous e-hailing service in Bangladesh focusing motorbike services with 'beat the traffic' slogan based on 'Go-Jek" Jakarta's (Indonesia) business model (Elius, 2018). Recent World Bank study explores average speed in Dhaka is between 7.0-8.0 km/hour and car moves 12 km/hour whereas Pathao bikes moves at 16 km/hour (Akhter, 2018). The passenger sends a pick-up request by the ride-

sharing app, selecting trip request on map nearest driver located, later the driver drops the passenger at desired destination within a fixed fare calculated by apps starting point to arrival point (Mamun, 2017). General Packet Radio Service (GPRS) or google map facilitates tracking service for both rider-driver and riders can rate scores for the drive (Balachandran & Hamzah, 2017). However, Pathao got much acceptance in motorbike-sharing because of unique business policy but Uber launched 'UberMOTO'- a motorbike service, to beat Pathao in quarter of 2017 (Ahmed, 2017). Within November 2017, 5 lakh computers opted for ride-hailing cars and bikes via 'E-hailing' (Ullah & Islam, 2018). Pathao, share-A-Motorcycle (SAM), Chalo, Amar Ride, BDCABS, MUV, Bahon, Ezzyr, Taxiwala, Dako, Goti, Hellowride, Trippo, Lets Go are 14 ride-hailing startups in Dhaka (Akhter, 2018).

In this ride-sharing economy, these came just like a blessing from 2016 (Kamal & Ahsan, 2018). Dhaka city is taken as the scope of the study for this research, as the population number is increasing and a significant number of commuters in this city regularly utilize these services observed by the researcher. Thus if these people's choices, preferences, comfort level and expectation are measured appropriately; the findings may serve as the standard to follow for future marketers in this service sectors of developing countries and Uber and Pathao ride-sharing service providers get the advantage more.

Customer Satisfaction and Service Quality
Customer satisfaction has become the imperative variable for sustaining mature market position in the long term perspective in this fierce market place. Although having many difficulties Bangladesh is achieving positive image of exponential technological advancement (Ullah & Islam, 2017; Hassan, 2017). Among all of the developments wireless services, 4G initiation by government support, flexible penetration of electrical devices, thriving educated individuals are noteworthy. Bilgili B., Candan B. and Bilgili S. (2014) proved by a recent research that customer acquisition advantage is mainly dependent on quality, image and customer loyalty mainly in service industry. Whereas, Ross (2015) proposed to leverage and adapt the customers' need requirements first then offer the value proposition. Service quality can be maintained by the nourishment of each customer touch-points from the initiation to the consumption (Sharma & Das, 2017). The touch-points are confirming the pick-up call to the rider or driver through the apps, GPS tracking, travel time, behavior of drivers, timeliness, cleanliness of the transport, payment system etc (Hosru & Yeboah, 2015). All these affect the impression of the total ride-sharing service satisfaction.

In transportation sector customer satisfaction is studied on service quality and perceived value in influencing satisfaction (Begum & Momotaz, 2014). Vilazaki & Govender (2014) explored commuters' perceptions matched with transport service providers performance initiated satisfaction. Customer satisfaction is an individual deliberation whether they satisfy or dissatisfy regarding individuals expectations of product or service performance (Kotler & Keller, 2006). Zeithaml, Parasuraman, & Berry (1990) defined that, "the number of customers or percentage of total customers, whose reported experience with a firm, its products, or its services (ratings) exceeds specified satisfaction goals". Among several academics, Vilakazi & Govender (2014)

explored commuters' perception can be enhanced by sincerity regarding service performance, time schedule maintenance, reliability regarding problem solution, security, smoothness of service, fare rates and comfort level. Elmeguid et al. (2018) explored empirically that ride-sharing service Uber and Careem prominently meet Egyptian commuters' expectations in Alexandria, but lack of achieving perceived safety and consumer protection requirements. Vietnamese ride-sharing passengers' future intention-to-purchase is influenced by perceived ease of use and perceived usefulness (Giang, Trang & Yen, 2017). Indonesian GO-JEK ride-sharing service commuters are satisfied with ease of use, accessibility and interactivity which have been proved quantitatively (Silalahi, Handayani & Munajat, 2017). Kumar & Sentamilselvan (2018) researched call taxi services in Chennai, India and revealed the level of comfort, ease of access, tariff system, promotion, safety and convenience with overall satisfaction dominate the reasons to utilize available services. Flexible job offers, incentives, user-friendly applications motivate Uber drivers in the U.S. serving quality service (Alan & Hall, 2015) and same in Pune city, India (Mahapatra & Telukoti, 2018). Permatasari, D. (2017), Hosru & Yeboah (2015) and Vilakazi & Govender (2014) accepted SERVQUAL as the (Parasuraman et. al., 1985) model measuring perception gap between perceived and expected service quality of transportation service implemented by tremendous researchers until now. Initially its dimensions were 10 (reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the consumer, and tangibles), later these were revised to 5 (reliability, responsiveness, empathy, assurances and tangibles) (Hosru &Yeboah, 2015; Parasuraman et. al., 1985).

However few studies exclusively examined e-hailing ride-sharing user perspective with exception of Rasheed et al. (2018), who found service quality and passenger satisfaction in Pakistan regarding e-hailing services. Moreover, Li, Hong & Zhang (2016) revealed e-hailing services acceptance above taxi vehicles in traffic gridlock. Balachandran & Hamzah (2017) explored ride-sharing commuters' satisfaction by SERVQUAL invented by Parasuraman et al. (1985) and comfort and price discovered by McKnight et al. (1986). Additionally, Sharma & Das (2017) in India and Hosru & Yeboah (2015) in Ghana found improving SERVQUAL dimensions on ride-sharing services, customer satisfaction increased. Ross (2015) explored customers in Washington influenced by prompt arrival associating SERVQUAL model. Khuong & Dai (2016) in Vietnam, Korale et al. (2015), Govender K. in South Africa (2014) and Sumaedi et al. (2012) in Indonesia researched about customer satisfaction in public transportation and discovered improved services satisfy passengers' perceived service. Imran (2014) explored shared services are satisfied with affordability, ease of payment and travel time.

Nevertheless, Bangladesh is backward in analyzing mainstream ride-sharing services regarding customer satisfaction; resulting research gap of this study. Thus, the researcher is concerned crucially with these grounds in this study exploring the influential factors in customer satisfaction matching expectation and perception by comparative study of two prominent app-based ride-sharing services- Uber and Pathao in Dhaka city. For identifying most relevant factors influencing riders' satisfaction, five dimensions namely, reliability, responsiveness, assurance, empathy and trust from SERVQUAL (Parasuraman et al., 1985) are used.

Materials and Methodology

This study used both quantitative and qualitative approach to discover a deeper and detail insights of the relationships between service quality expectations and ride-sharing commuters' perceptions comparing Uber and Pathao services in Dhaka city. Primary data were collected through administering a semi-structured questionnaire from active customers of both Uber and Pathao in Dhaka city by two pair of questionnaires dividing 216 respondents in two parts (108 in each) by face-to-face and online survey throughout August-November 2018 by 15 closed-ended and 1 open-ended questions. Non probability purposive sampling technique has been utilized for ease of collecting specific users' data. This technique has been used as to grab the essential insights and level of satisfaction regarding specific two app based ride sharing service companies conducted upon university students, service persons, entrepreneurs and other active commuters aged 18 to 65 and more. This technique also supported the ease of data collection in Dhaka city with chain referral process locating Uber and Pathao rides commuters effectively; otherwise it would be more time consuming and difficult to locate only active commuters of two service providers. Five teams of 20 volunteer students of both private and public universities were recruited by the researchers to collect survey data from Uber and Pathao rides passengers for four months in Dhaka city by non-probability purposive sampling, as respondents are selected based on availability, consent and most importantly they have to be the active commuter of these two prominent ride-sharing service provider. The teams were responsible for collecting data by their university acquaintances, friends, surrounding peers through online and face-to-face questionnaire distribution and the researcher announced some gifts for the team gathering highest data collection. 228 questionnaires were collected in total but 216 were readily useable with completeness.

Questionnaire was adapted from several previous transport satisfaction studies, then modified in Bangladeshi context. Pilot study has been conducted in the form of face validity by utilizing two experts' opinion and 27 Uber and Pathao commuters' opinion before collecting primary data. This also ensures to correct the wrong wording of the questionnaire and appropriate format to pin point the thoughts of participants. Reliability analysis also been operated by SPSS-version 25.0 of Cronbach's alpha which resulted higher loadings than 0.70 indicating good internal consistency (Hair, 2010). Table I showing the values of reliability analysis of this study.

Table I: Reliability analysis

| Construct/Latent Variable	Scale Items	Cronbach's Alpha for the scale
Reliability	3	.751
Responsiveness	3	.802
Assurance	3	.786
Empathy	3	.791
Tangibility	3	.804

Results and Analysis

For the appropriateness of this descriptive studies data analysis SPSS version 25.0 was used for analyzing 216 respondents profile, prioritizing factors regarding e-hailing customers' satisfaction, finding most influential items by linear regression and coefficients of both Uber and Pathao services. Sample size from each ride-sharing service is 108 and five dimensions of SERVQUAL model by Parasuraman et al. (1985) has been measured by 15 items in each using (consisting 3 items with each dimension) five-point likert scales and 1 open-ended question, to be completed within 9 minutes without any elimination.

Sample profile
From table II, total respondents are 216 and majority of the e-hailing service users aged 26-35 resulted 43.74%, 36-65 aged commuters are in 38.62% which is the second range and rest of the two groups are young and elders. In this research the lowest users aged 65 and above who are elder commuters represent only 1.05%. Moreover, male commuters are the major consumers of these two particular ride sharing services. Males are 72.01% whereas female commuters are 27.99% in total. This indicates that female commuters are not still used to regarding e-hailing services in Dhaka city. In the occupational context service holders randomly utilize these services as they contain larger portion of Uber and Pathao commuters in 63.54%, rest of the categories are business persons in 20.46%, students are 9.39% and other occupations commuters include 6.61% among total 76 respondents. The demographic profile also indicates that majority of ride-sharing users 65.09% earn between Tk. 20000-50000 per month. However, the frequency rate of travelling Uber and Pathao showing highest 37.45% users travel only once a month which is not a good sign of frequency.

Exploratory Factor analysis (EFA)
The unexplained and unobserved factors impacting co-variation among several observations is termed as exploratory factor analysis (Hall, 2017). Factor analysis has been used identifying customer satisfaction regarding transport services previously (Rahaman & Rahaman, 2009; Hossain & Islam, 2013).

Table II: Demographic Profile of the Sample
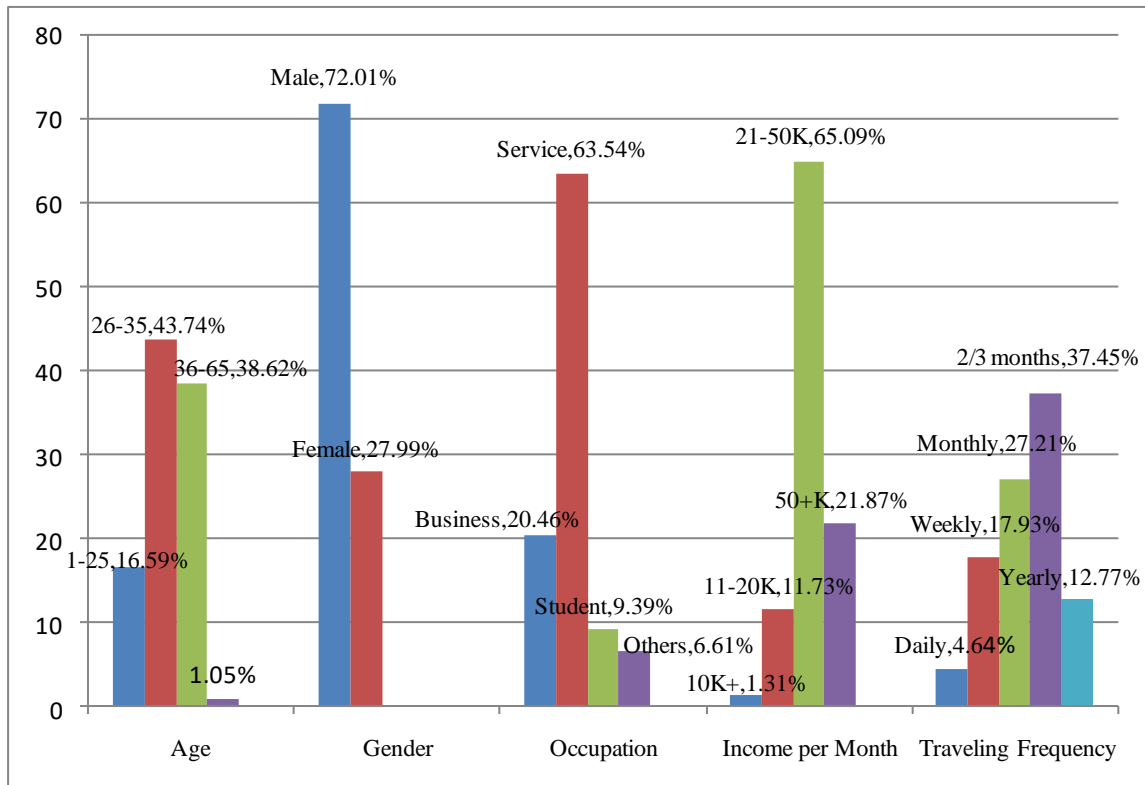
Table III: KMO and Bartlett's Test of Sphericity of Uber

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.763
Bartlett's Test of Sphericity	Approx. Chi-Square	627.089
	df	105
	Sig.	.000

Table IV: Communalities of Uber

Variables	Initial	Extraction	Variables	Initial	Extraction
Reliability_1 Smartphone app-based ride sharing services provide on-time departure and arrival without delay	1.000	.559	Assurance_3 Trained drivers are responsible to drive vehicles	1.000	.615
Reliability_2 GPS tracking updates ride information availability	1.000	.499	Empathy_1 Drivers & employees are gentle to riders	1.000	.719
Reliability_3 24/7 hour customer-care service is available	1.000	.297	Empathy_2 Drivers & employees understand passengers specific demands and needs	1.000	.509
Responsiveness_1 Quick services provided by service employees	1.000	.614	Empathy_3 Fares are customer friendly and affordable	1.000	.703
Responsiveness_2 Quick response to complaint handlings	1.000	.502	Tangibility_1 Vehicles physical condition is satisfactory	1.000	.425
Responsiveness_3 Drivers readily help passengers	1.000	.589	Tangibility_2 Drivers appearance is professional	1.000	.680
Assurance_1 Security is adequate in the ride-sharing vehicles	1.000	.590	Tangibility_3 Cleanliness of the vehicles are satisfactory	1.000	.604
Assurance_2 Safety information for passengers exists in vehicles	1.000	.661			

Extraction Method: Principal Component Analysis

Table V: Total Variance Explained of Uber

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**5.859**	**39.062**	39.062	5.859	39.062	39.062	3.506	23.375	23.375
2	**1.452**	**9.678**	48.740	1.452	9.678	48.740	2.902	19.346	42.721
3	**1.255**	**8.368**	**57.109**	1.255	8.368	57.109	2.158	14.387	**57.109**
4	.981	6.541	63.649						
5	.959	6.390	70.039						
6	.838	5.585	75.625						
7	.763	5.085	80.710						
8	.625	4.170	84.880						
9	.521	3.472	88.352						
10	.448	2.985	91.336						
11	.398	2.655	93.992						
12	.304	2.025	96.017						
13	.230	1.530	97.547						
14	.202	1.344	98.891						
15	.166	1.109	100.000						

Extraction Method: Principal Component Analysis.
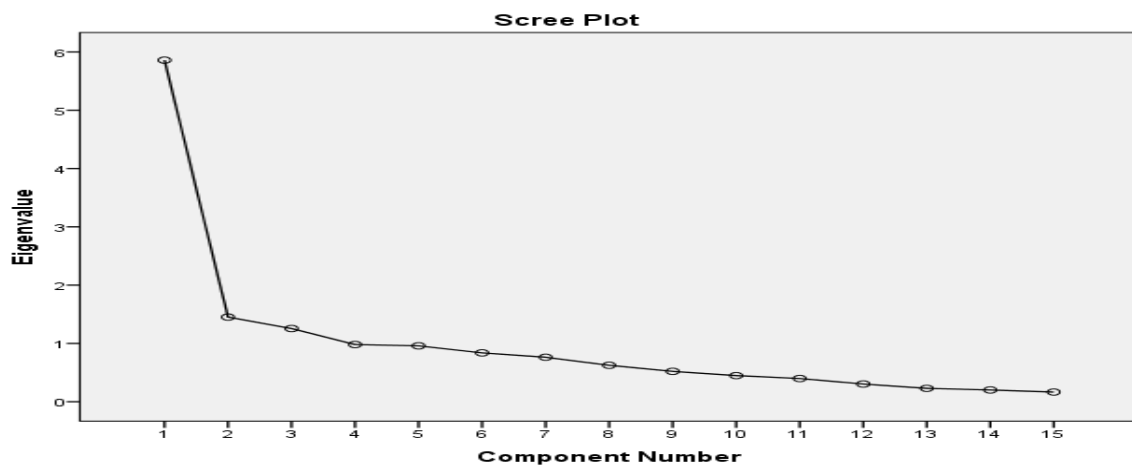
Table VI: Rotated Component Matrix[a] of Uber

	Component		
	1	2	3
Assurance_3	.749		
Responsiveness_1	.740		
Responsiveness_2	.678		
Assurance_1	.568		
Reliability_2	.531		
Empathy_2	.502		
Reliability_3	.454		
Assurance_2		.809	
Responsiveness_3	.	.644	
Empathy_1		.633	
Reliability_1		.589	
Tangibility_1		.539	
Tangibility_2			.773
Tangibility_3			.705
Empathy_3	.		.626

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The 15 items of the customer satisfaction scale were subjected to principal component analysis (PCA) using SPSS-25. Prior to performing PCA, the suitability of data for exploratory factor analysis (EFA) was conducted for two sets of questionnaires for each of the ride-sharing commuters. Inspection of the correlation matrix explored the presence of many coefficients of 0.30 and above for both. The Kaiser-Meyer-Olkin value was 0.763 conducted upon Uber commuters response and 0.803 revealed by Pathao commuters response, exceeding the recommended value of 0.60 and Bartlett's Test of Sphericity (Hall, 2017) reached statistical significance, supporting the factorability of the correlation matrix in table III and VII.

To clarify communalities table of Uber (table IV) and Pathao (table VIII); the amount of variance in each item for separate ride-sharing services is presented. All the values except, item Reliability_2 (24/7 hour customer service is available) in extraction column of table IV showed 0.297 (less than 0.3) and this lowest communality value indicated that the item doesn't fit well with other items in the component for Uber factors (Pallent, 2016). Whereas, the entire extraction item values in table VIII represented more than 0.3 as well as other items fitness of component for Pathao factors.

Principal components analysis revealed the presence of three components with eigenvalues exceeding 1 of three-component solution explained a total of 57.11% of the variance, with component 1 contributing 39.06%, 9.68% by component 2 and 8.37% by component 3 for Ubers' commuter responses in table V. Whereas, a total of 61.43% of the variance with the contributions of component 1, 2, 3 by 43.95%, 9.44% and 8.05%; explored gradually for

Pathaos' commuter responses in table IX. An inspection of the screeplot revealed a clear break after the third component. Using Catell's (1966) scree test, it was decided to retain three components for identifying influential factors affecting commuters' perception separately for Uber and Pathao.

To aid in the interpretation of these three components, varimax rotation was performed. The rotated solution revealed the presence of strong loadings and 15 variables loading substantially on only one component. This result is consistent with previous research of passengers' customer satisfaction on items of SERVQUAL model, with items loadings separately on more than two components. The results of this analysis support the use of SERVQUAL model items as separate scales, as revealed by similar authors (Luke & Heynes, 2017, Mikhaylov, Gumenyuk & Mikhaylova, 2015; Yarimoglu, 2014, Muthupandian & Vijayakumar, 2012) . These statistical results support the validity and reliability of the questionnaire and signifying the goodness of data for this study.

For Ubers' factor analysis, the rotated component matrix it is observed that component 1 has high coefficients for Assurnace_3 (Trained drivers are responsible to drive vehicles) thus this factor may be labeled a 'drivers' expertise' factor. Alternatively, component 2 is highly related with Assurnace_2 (Safety information for passengers exists in vehicles) thus labeled as 'passengers safety' factor and component 3 has high coefficients for Tangibility_2 (Drivers' appearance is professional); labeled 'drivers appearance'. Thus commuters appear to satisfy by three major kinds of expectation from Uber ride-sharing services.

Rotated component matrix of exploratory factor analysis for Pathao explored, component 1 has high coefficients for Assurance_2 (Safety information for passengers exists in vehicles) so this may be labeled as 'passengers safety' factor. Reliability_2 (GPS tracking updates ride information availability) loads highest in component 2 which labeled as 'GPS updates' as well as, component 3 showed high coefficients for Tangibility_1 (Vehicles physical condition is satisfactory) labeled as 'vehicle condition'.

Table VII: KMO and Bartlett's Test of Sphericity of Pathao

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.802
	Approx. Chi-Square	835.427
Bartlett's Test of Sphericity	df	105
	Sig.	.000

Table VIII: Communalities of Pathao

Variables	Initial	Extraction	Variables	Initial	Extraction
Reliability_1 Smartphone app-based ride sharing services provide on-time departure and arrival without delay	1.000	.470	Assurance_3 Trained drivers are responsible to drive vehicles	1.000	.748
Reliability_2 GPS tracking updates ride information availability	1.000	.711	Empathy_1 Drivers & employees are gentle to riders	1.000	.577
Reliability_3 24/7 hour customer-care service is available	1.000	.492	Empathy_2 Drivers & employees understand passengers specific demands and needs	1.000	.597
Responsiveness_1 Quick services provided by service employees	1.000	.663	Empathy_3 Fares are customer friendly and affordable	1.000	.550
Responsiveness_2 Quick response to complaint handlings	1.000	.669	Tangibility_1 Vehicles physical condition is satisfactory	1.000	.726
Responsiveness_3 Drivers readily help passengers	1.000	.484	Tangibility_2 Drivers appearance is professional	1.000	.584
Assurance_1 Security is adequate in the ride-sharing vehicles	1.000	.615	Tangibility_3 Cleanliness of the vehicles is satisfactory	1.000	.595
Assurance_2 Safety information for passengers exists in vehicles	1.000	.735			

Extraction Method: Principal Component Analysis

Table IX: Total Variance Explained of pathao

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**6.592**	**43.946**	43.946	6.592	43.946	43.946	4.058	27.053	27.053
2	**1.416**	**9.437**	53.383	1.416	9.437	53.383	3.701	24.676	51.729
3	**1.207**	**8.045**	**61.428**	1.207	8.045	61.428	1.455	9.699	**61.428**
4	.945	6.298	67.726						
5	.868	5.786	73.512						
6	.728	4.854	78.366						
7	.593	3.953	82.319						
8	.517	3.447	85.766						
9	.452	3.016	88.782						
10	.436	2.904	91.686						
11	.373	2.484	94.170						
12	.315	2.098	96.269						
13	.262	1.750	98.019						
14	.185	1.236	99.255						
15	.112	.745	100.000						

Extraction Method: Principal Component Analysis.

Scree Plot
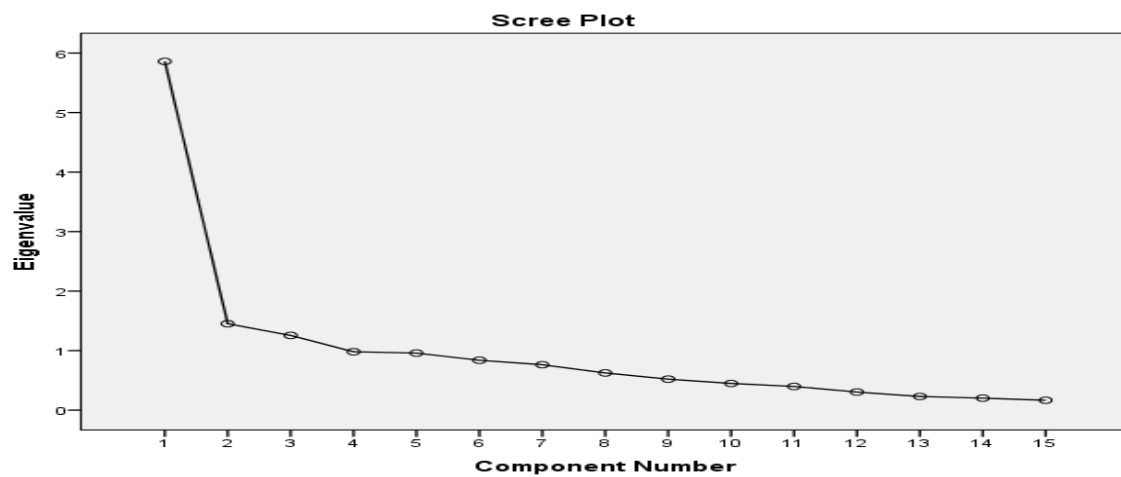
Table X: Rotated Component Matrix^a of Pathao

	Component		
	1	2	3
Assurane_2	.840		
Responsiveness_1	.702		
Reliability_3	.678		
Empathy_3	.641		
Assurance_1	.633		
Empathy_1	.631		
Responsiveness_2	.528		
Reliability_2		.764	
Empathy_2		.718	
Tangibility_3		.700	
Tangibility_2		.663	
Responsiveness_3		.614	
Reliability_1		.572	
Tangibility_1			-.773
Assurance_3	.		.600

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Customer Satisfaction Model

Among 15 items of SERVQUAL dimensions analyzed by exploratory factor analysis (EFA) (See table VI) 'drivers' expertise', 'passengers safety' and 'drivers appearance' are the three components identified as momentous playmakers on Uber ride-sharing commuters service quality perception in Figure 1 and 'passengers safety', 'GPS updates' and 'vehicle condition' (See table X) are retrieved from Pathao ride-sharing commuters service quality perception in Figure 2. This model is derived with the statistical evidence.
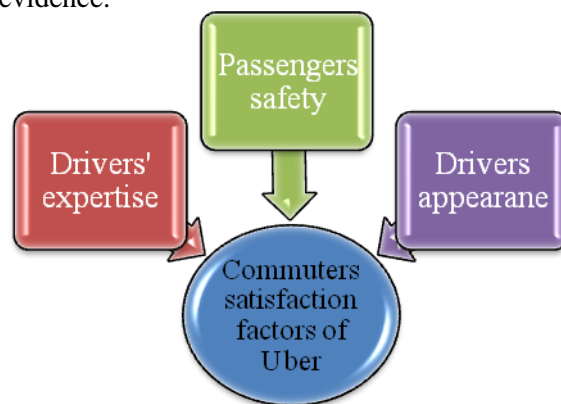

Figure: 1 Research model for influential factors of commuters' satisfaction of Uber on ride-sharing services
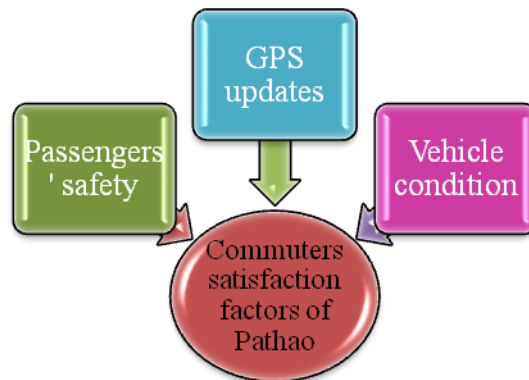*(Source: Author)*

Figure: 2 Research model for influential factors of commuters' satisfaction of Pathao on ride-sharing services *(Source: Author)*

Service Gap

The first set of questionnaire is used to measure both respondents' expectations separately of two e-hailing services offered and second set used to measure their perceptions regarding perceived services delivered. Then, average expectation scores and the average perception scores for each SERVQUAL dimensions obtained using the formula, perceptions (P) – expectations (E) (See table XI and XII). The total difference between customers' expectation and perception of Uber is -0.634 indicating the level of customer dissatisfaction. Among the SERVQUAL dimensions, Uber customers are highly dissatisfied with assurance dimension.

Table XI: Relative Position of the Dimension Based on Service Gap for Uber

Dimension	Expectation Score (E)	Perception Score (P)	Gap Score (P-E)	Average Gap Score
Reliability	8.88	8.95	0.07	-0.634
Responsiveness	8.73	8.83	0.10	
Assurance	12.15	9.13	-3.02	
Empathy	8.94	8.57	-0.37	
Tangibility	8.49	8.54	0.05	

Service Gap

The average SERVQUAL score for Pathao is 0.490 indicating passengers' satisfaction of service quality in table XII. But, there is a lack of responsiveness and tangibility in providing service according to customers' expectation.

Table XII: Relative Position of the Dimension Based on Service Gap for Pathao

Dimension	Expectation Score (E)	Perception Score (P)	Gap Score (P-E)	Average Gap Score
Reliability	7.48	7.86	0.38	0.490
Responsiveness	7.62	6.48	-1.14	
Assurance	8.80	8.97	0.17	
Empathy	7.37	8.54	1.17	
Tangibility	7.01	6.92	-0.09	

Comparison

Customer satisfaction rate for Pathao e-hailing service in Dhaka city shows, Pathao has been able to meet customers' expectations with 49% satisfaction rate.

However, customer satisfaction rate for Uber e-hailing service in Dhaka city shows, Uber has been unable to meet customers' expectations. Uber got lowers perception rate in assurance and empathy with overall -63% dissatisfaction rate.

Recommendations and Conclusion

Discussion

The SERVQUAL dimensions of Parasuraman et al (1985) modified to the context of Bangladesh with 15 items distributed equally amongst the five different dimensions. Factor analysis conducted differently upon two ride-sharing service providers commuters in Dhaka city revealed assurance and tangibility affects both group of commuters' perception scores more adding reliability for Pathao. Hence, accumulated perception scores across both, are less than expected scores signaling less satisfactory service quality in app-based ride-sharing service economy in Dhaka. Specifically, the service gap negatively scored high (-0.634) for Uber fell short in assurance and empathy dimensions. These indicate the unsatisfactory safety measures, gentleness of the drivers against Uber commuters' expectation. However, average gap score for Pathao revealed positive (0.490) along with negative gap scores in responsiveness and tangibility, directing to the disparity of quick complaint management and improved visible cues against Pathao commuters' desires. It is also worth to include that table XI and XII showing that Pathao commuters have lower expectations of service quality than Uber users, may be the attribution that Pathao Rides meet middle-class people needs. Nevertheless, wide gap exists between expectation and perception scores of Uber users but, proximate gap for Pathao; so it can be inferred that Pathao rides closer in meeting service level expectations than Uber. The high gaps with negative

average gap score of Uber specifically indicate failure of providing expected security, assuring passengers safety measures, unaffordable fares and unable to recognize customers desires.

The exploratory factor analysis and gap score has been identified by previous researchers employing SERVQUAL model for investigating mostly for public transport passengers' satisfaction by comparing two or more providers; but ride-sharing commuters' satisfaction still overlooked utilizing these perspectives. Elmeguid et al. (2018) empirically explored consumers' satisfaction level by contextual modifications of SERVQUAL dimensions of Uber and Careem in Alexandria and found that safety and consumer protection highly stimulate Egyptian ride-sharing commuters satisfaction. However the findings of this study resemble with Susilawati & Nilakusmawati (2017) who found safety and comfort as most influential variables affecting public bus passengers in Bali and Fellesson & Friman (2008) explored nine European cities perceived satisfaction level by SERVQUAL dimensions attaching 17 attribute-related statements analyzing factor analysis. Paramonovs & Ijevleva (2015) utilized factor analysis with SERVQUAL dimensions for airport passengers and Hossain & Islam (2013) for railway passengers in Chattogram and Dhaka in Bangladesh. Additionally, Muthupandian & Vijayakumar (2012) investigated passengers' perceptions of Tamil Nadu in India by SERVQUAL gap model and explored reliability and empathy dimensions did not match towards customers expectations. Luke & Heynes in South Africa (2017) and Mikhaylov, Gumenyuk & Mikhaylova (2015) identified assurance and tangibility as the service quality gap of public transport users expectations and perceptions in Kaliningrad, Russia. Yarimoglu (2014) recommended utilizing e-service quality models as SERVQUAL dimensions.

For comfort and reliable service, there are some recommendations based on survey of Uber and Pathao commuters in Dhaka city which are collected by an open-ended question in the semi-structured questionnaire. Pick-up time varies with ride-sharing apps and cancellation of Uber calls charging huge by faulty GPS, impacts reliability. Moreover, unprofessional Uber drivers are unable to navigate apps due to lack of training which negatively impacts responsiveness. 19 female Uber passengers were harassed by uncomfortable behavior by Uber drivers, thus it attacks assurance and security. Asking for tips, avoiding short trips, hoaxing extra charge with silly excuses, lack of 24/7 hour customer service channel and long-tedious complain proces; resulted Uber's negative perceptions. Whereas, Pathao commuters mostly recommend improving tangibility spectrum regarding physical condition, looking glasses and helmets, sudden engine failures. These problems should be resolved immediately.

Limitations of the study
Customer satisfaction is a broad area of study and in this research this is measured on SERVQUAL dimensions comparing two ride-sharing services only in Dhaka city, and this limits generalizability of the findings. Respondents' answers may involve biases based on received services thus objectivity of the study may be decreased. Unsystematic sampling procedure being utilized, future studies should approach systematic sampling. Future researchers could utilize current study's findings in an extended geographical coverage and upgraded services of app-based ride-sharing service companies.

Conclusion

To conclude, it can be said that e-hailing services in Bangladesh have brought tremendous change regarding customers' convenience, safety, reliability and comfort with quality services. Unfortunately, strategies working for U.S. may be unsuitable in Bangladeshi context because of narrow roads, traffic gridlocks, transportation culture and population. Uber fails to keep promise resulting customers dissatisfaction rate 63% because it is unable to locate customers feedback regularly, instant complaints management and unavailability of 24/7 hour customer call-center. Born by three millennials in Bangladesh, Pathao exponentially achieved social acceptance and positive word-of-mouth, meets customers expectations on the SERVQUAL dimensions with 49% rate. This study empirically serves as a sustainable competitive index for an improvement of these service provider's quality and Bangladesh Road and Transportation Authority (BRTA) should address additional measurement ensuring passenger oriented transport service.

References

Ahmed, S. (2017, November 22). **"**Uber's one year achievement in Bangladesh". Retrieved From:**http://www.banglanews24.com/technology/article/65170/Ubers-one-year-achievement-in-Bangladesh**. [Accessed online on 9th August, 2018]

Akhter, S. (2018, January 24). "Traffic Jams Turn Severe in Dhaka City". Retrieved From: **http://www.newagebd.net/article/33283/traffic-jams-turn-severe-in-dhaka-city**.   [Accessed online on 9th August, 2018]

Alan, K. & Hall, J. (2015). "An Analysis of the Labor Market for Uber's Driver Partners in the US", *Journal of Industrial Economics*, Vol. 56, no. 1, pp.54-78. http://dx.doi.org//doi/abs/10.1177/0019793917717222.

Bilgili, B., Canan, B., & Bilgili, S. (2014). "A Research study on the relational benefits, perceived quality and customer loyalty in different hospitality business", Vol. 16, no. 3, pp. 20-39.

Imran, R. (2014). "Measuring Public Transport Satisfaction from User Surveys", *International Journal of Business and Management"*, Vol. 9, no. 6, p.106.

Balachandran, I. & Hamzah, B.I. (2017). "The Influence of Customer Satisfaction of Ride-sharing Services in Malaysia", *International Journal of Accounting and Business Management*, Vol. 5, no. 2, pp.184-196.

Begum, R. & Momotaz, N.S. (2014). "Determinants of Passengers' satisfaction with CNG-Run Auto Rickshaw Services in Bangladesh: An Empirical Study on Dhaka City", *Journal of Marketing,* Vol. 15, no.1, pp 159-174.

Catell, R.B. (1966). *The scree test for number of factors.* Multivariate Behavioral Research, 1st edition, pp. 245-76.

Chetty, P. & Datt, S. (2017, February 7). "Reliability Test in SPSS using Cornbach Alpha". Retrieved From: https://www.projectguru.in/publications/reliability-test-cronbach-alpha/. [Accessed on 4 November, 2018]

Elius, M. H. (2018, August 3). "Moving Bangladesh ain't easy, but someone has to do it". Retrieved From: https://www.dhakatribune.com/opinion/2018/08/03/moving-bangladesh-ain-t-easy-but-someone-has-to-do-it. [Accessed online on 8th August, 2018]

Elmeguid, S.M.A., Ragheb, M.A., Tantawi, P.I., Elsamadicy, M. (2018). "Customer satisfaction in sharing economy the case of ridesharing service in Alexandria, Egypt", *8 th International Conference on Restructuring of the Global Economy*, 9-10th July 2018, The Business and Management Review, Vol. 9, no.4, pp. 373-382. University of Oxford, UK.

Fellesson, M. & Friman, M. (2008). "Perceived Satisfaction with Public Transport Service in Nine European Cities," *Journal of the Transportation Research Forum*, Vol. 47, No. 3, pp. 93-103.

Giang, P.T., Trang, P.T. & Yen, V.T. (2017). "An Examination of Factors Influencing the Intention to Adopt Ride-Sharing Applications: A Case Study in Vietnam," *Imperial Journal of Interdisciplinary Research (IJIR),* Vol-3, no. 10, pp.618-623.

Govender, K. (2014). "Public Transport Service Quality in South Africa: A Case Study of Bus and Min Bus Services in Johannesburg". *African Journal of Business Management,* Vol. 8, no. 10, pp. 317-326.

Hair, J. F., Jr., Black, W.C., Babin, B. J. & Andersen, R.E. (2010). *Multivariate Data Analysis: A global perspective.* Pearson Prentice Hall, Upper Saddle River, NJ.

Hall, S. (2017, September 29). "What is the purpose of factor analysis?" Retrieved From: https://sciencing.com/what-is-the-purpose-of-factor-analysis-12225143.html. [Accessed online on 12th August, 2018]

Hassan, A. (2017, May 16). "Special Feature: Uber and Pathao." Retrieved From: https://www.thedailystar.net/lifestyle/uber-grows-dhaka-1405597. [Accessed online on 6th August, 2018]

Hosru, N.E. & Yeboah, T.S. (2014). "Influence of Service Quality on Customer Satisfaction: A Study of Minicab Taxi Services in Cape Coast, Ghana," *International Journal of Economics, Commerce and Management,* Vol. 3, no. 5, pp. 1451-1464.

Hossain, B. & Islam, S.M. (2013). "Determinants of Customer Satisfaction on Service Quality of Railway Platforms in Bangladesh: A Study on Chittagong and Dhaka Railway Platforms," *Journal of Business Studies*, Vol. 34, no. 1, pp.63-84.

Irani, B. (2017, June 21). "Demands for Pathao shoots to the roof". Retrieved From: https://www.dhakatribune.com/bangladesh/dhaka/2017/06/21/pathao-popularity-doubled-ramadan. [Accessed online on 9th August, 2018]

Kamal, M.S. & Ahsan, A, N. (2018, April 28). "Uber-Pathao' ride-share's impact on Dhaka". Retrieved From: https://thefinancialexpress.com.bd/views/uber-pathao-ride-shares-impact-on-dhaka-1524842540. [Accessed online on 8th August, 2018]

Khuong M. N. & Dai N. Q. (2016). "The Factors Affecting Customer Satisfaction And Customer Loyalty - A Study Of Local Taxi Companies In Ho Chi Minh City," *Vietnam. International Journal Of Innovation, Management And Technology,* Vol. 7, no. 5, pp. 149-162.

Korale, V., Mandari, J. & Suh, M. (2015). "Customer satisfaction in public transportation: A case study of SJ traveler's perception in Sweden". Bachelor Dissertation, Malardalen University, School of Business.

Kotler P. & Keller K. (2006; 2009). *Marketing Management*, 12th Edition, Pearson Education Inc, New Jersey.

Kumar, H., Sentamilselvan, K., (2018). "Customer Satisfaction towards Call Taxi Services A study with reference to Chennai". International Journal of Pure and Applied ateatics, Vol. 119, no. 12, pp. 14919-14928.

Li, Z., Hong, Y. & Zhang, Z. (2016). "An Empirical Analysis of On-demand Ride Sharing and Traffic Congestion", I*nternational Conference on Information Systems, ICIS 2016.*

Luke, R. & Heyns, N. (2017). "Measuring Commuters perceptions of Service Quality of Selected Public Bus Services in the city of Johannesburg". 36th Southern African Transport Conference (SATC 2017), 10-13 July, 2017, Pretoria, South Africa.

Mahapatra, S. & Telukoti, P. (2018). "Challenges Faced by Uber Drivers and Consumers Satisfaction in Pune City", *Global Journal for Research Analysis*, Vol. 7, no. 2, pp. 358-360.

Mamun, S. (2017, December 31). "2017 in review: A revolution in public transportation". Retrieved From: https://www.dhakatribune.com/bangladesh/dhaka/2017/12/29/2017-review-ride-hailing-tech-companies-saw-rapid-growth. [Accessed online on 8th August, 2018]

Mikhaylov, A., Gumenyuk, I. & Mikhaylova, A. (2015). "The SERVQUAL model in measuring service quality of public transportation: evidence from Russia", Quality Management, Vol.16, no. 144, pp. 78-83.

Muthupandian, K.S. & Vijayakumar, C. (2012). "Measurement of passengers service quality in public transportation: servqual analysis", Munich Personal RePEc Archive, Retrieved from: https://mpra.ub.uni_muenchen.de/38585/MPRA. [Accessed online 12 December, 2018]

Pallant, J. (2016). "*SPSS Survival Manual: A Step By Step Guide to Data Analysis Using SPSS Program (6th ed.)*", London, UK: McGraw-Hill Education.

Paramonovs, S., & Ijevleva, K. (2015). "Factor Analysis of Passengers' Satisfaction at "RIGA International Airport", *Economics and Business*, 27(1), pp. 46-52. https://doi.org/10.1515/eb-2015-0007.

Parasuraman, A., Zeithaml, V., & Berry, L. L. (1985). "A Conceptual Model of Service Quality And Its Implications For Future Research". *Journal of Marketing,* Vol. 49, no. 4, pp. 41-50.

Permatasari, D. (2017). "The customer satisfaction towards the service quality of Tawang Alun Malang-Banyuwangi Train", *IOP Conference Series: Earth and Environmental Science*, Vol. 70, no. 1-9. http://dx.doi.org/:10.1088/1755-1315/70/1/012009.

Rahaman R.K. & Rahaman M. A. (2009). "Service Quality Attributes Affecting the Satisfaction of Railway Passengers of Selective Route in Southwestern Part of Bangladesh", *Theoretical and Empirical Research in Urban Management*, Vol. 3, no. 12, pp.214-224.

Rasheed, R., Mazhar, F. & Shahid, M. (2018). "Mobile app-based Taxi Services and Customer Satisfaction: An empirical review form Lahore city, Pakistan", *International Journal of Economics, Commerce and Management*, Vol.6, no. 5, pp. 330-340.

Ross, H. (2015). "Ridesharing's House of Cards: O'Connor V. Uber Technologies, Inc. and the viability of Uber's labor model in Washington". *Wash. L. Rev.,* Vol. 90, no. 2, p. 1431.

Sadat, S. (2018, January 30). "What ride-sharing apps can teach us about accountability". Retrieved From: https://www.dhakatribune.com/opinion/op-ed/2018/01/30/ride-sharing-apps-can-teach-us-accountability. [Accessed online on 8th August, 2018]

Sharma, K. & Das, S. (2017). "Service Quality & Customer Satisfaction- With Special Focus on Online Cab Industry in India", *International Journal of Business and Management,* Vol. 12, no. 7, pp. 192-200. http://dx.doi.org/10.5539/ijbm.v12n7p192.

Silalahi, S. L.Br., Handayani, P.W. & Munajat, Q. (2017). "Service Quality Analysis for Online Transportation Services: Case Study of GO-JEK," 4th Information Systems International Conference 2017, *ISICO 2017*, 6-8 November 2017, Bali, Indonesia, pp. 487-494.

Sumaedi S.I, Bakti G. M. Y., & Yarmen M. (2012). "The Empirical Study Of Public Transport Passengers' Behavioral Intentions: The Roles Of Service Quality, Perceived Sacrifice, Perceived Value, And Satisfaction (Case Study: Paratransit Passengers In Jakarta, Indonesia)", *International Journal For Traffic And Transport Engineering,* Vol. 2, no. 1, pp. 83 –97.

Susilawati, M. & Nilakusmawati, D. P. E. (2017). "Study on the factors affecting the quality of public bus transportation service in Bali Province using factor analysis." International Conference on Mathematics: Education, Theory and Application, *Journal of Physics: Conference Series*, pp. 1-7. http://dx.doi.org/10.1088/1742-6596/855/1/012051.

Ullah, W.M.G. & Islam, A. (2017). "A Case Study on Pathao-: A Technology Based Solution to Dhaka's Traffic Congestion Problem", *Case studies in Business and Management,* Vol. 4, no. 2, pp. 100-108.

Vilakazi, A. & Govender, K. (2014). "Commuters' Perceptions of Public Transport Service in South Africa"*, Journal of Social Sciences (COES&RJ-JSS),* Vol. 3, no. 1, pp. 258-270.

Williams, B., Onsman, A. & Brown, T. (2010). "Exploratory factor analysis: A five-step guide for novices," *Journal of Emergency Primary Health Care (JEPHC), Vol. 8, no.* 3, pp. 1-13. Retrieved From: https://ajp.paramedics.org/index.php/ajp/article/view/93. [Accessed online 6 June, 2018]

Yarimoglu, K.E. (2014). "A Review on Dimensions of Service Quality Models". *Journal of Marketing Management,* Vol.2, no. 2, pp. 79-93.

Zeithaml, V.A., Parasuraman, A. & Berry, L.L. (1990). *Delivering quality service-Balancing customer perceptions and expectations*, New York, NY: The Free Press.

Please see https://thefinancialexpress.com.bd/national/dhaka-worlds-2nd-worst-city-to-live-in-study-1534224048. [Accessed online 24 September 2018]