

ASSESSMENT OF PERCEIVED SERVICE QUALITY OF LAUNCH SERVICES IN DHAKA-BARISHAL ROUTE

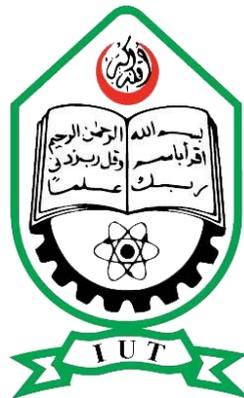
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**The Thesis Submitted for the
Degree of Bachelor of Science in Civil Engineering (Bsc.)
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Approval

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Dedication

This thesis is dedicated to our loving parents and the devoted teachers who have played an integral role in its completion. Their unwavering support, guidance, and belief in our abilities have been instrumental throughout this journey.

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Abstract

The transportation sector of Bangladesh has been gaining much interest over the last few decades. Inland water transport is a high-demand mode of public transportation in Bangladesh due to its numerous rivers. Launch transport service plays a crucial role in connecting various parts of the country, especially in the southern region. Until recently before constructing the Padma Bridge the water route was the only option for travelers, which led to the deterioration of service quality of inland launch transport services. Despite its importance, there is limited research on the perceived service quality of the inland water transport system in Bangladesh. This study aims to fill this research gap by investigating the perceived service quality of the inland water transport system, specifically on the Dhaka to Barishal route. Data was collected from 260 randomly selected passengers who used this transportation mode. It was acquired through interviews with the use of a questionnaire survey based on literature review, local context and pilot survey interview. The collected data was analyzed using count data model, which is a statistical model commonly used in transportation research. The independent variables are formed from the socio-economic and demographic characteristics, travel characteristics and travel experiences of the respondents. Dependent variable i.e. perceived service quality, which will be developed from the questionnaire related to comfort, punctuality, cleanliness, safety, staff characteristics, harassment, food quality and medical facilities of the service. The findings of this research provide a detailed knowledge of the perceived service quality of Bangladesh's inland water transport system where the Dhaka-Barishal route has been selected as a case study. This result can help to improve the service quality by sorting out the main factors affecting the various components of the service quality and aid policymakers to make policies and take necessary steps to meet the needs of the passengers.

Keywords: Service Quality, Count Data Model, Launch Service, Socio-economic & Demographic Characteristics, Travel Characteristics, Public Transportation, Water Transportation.

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Chapter 1: Introduction

1.1 Background

Bangladesh's transportation system relies heavily on inland water transport (IWT), which offers both people and commodities an accessible and reasonably priced mode of transportation. Bangladesh has a significant river network that stretches 14,000 kilometers and comprises about 700 rivers. These rivers have a total navigable length of 5,968 kilometers during the monsoon season and 3,865 kilometers during the dry season (BIWTA, 2003).

Rivers were the main form of transportation in Bangladesh before the creation of the road and rail networks. Even now, a lot of people use water transportation to get around inside and between districts, particularly in southern districts like Barishal, Jhalokathi, Bhola, Borguna, Patuakhali, and Pirozpur, as well as with the capital city of Dhaka. The Dhaka-Barishal river route is extremely congested since, before the completion of the Padma Bridge, it was the only reasonably priced way to connect these two areas.

According to Ashraf et al. (2002), Bangladesh's inland waterway network carries about 1.5 million people each route kilometer of waterway annually. Around 10,000 people travel the Dhaka-Barishal road alone every day (The Financial Express, 2022). Water transportation is a common option for travelers due to its affordability and safety factors. In a comparative assessment of accidents between 2008 and 2014, roads had the biggest percentage, at 87%, followed by railways with 12% of the total events, and waterways with 1% (Probha & Hoque, 2018).

Although water transportation has a geographic advantage and is economical, there are problems with service quality. Steps to resolve service quality issues were not sufficiently taken because of a lack of study and the fact that the vast majority of passengers were captive riders. Prior research has mainly examined how satisfied passengers are with various public transportation options (Agarwal, 2008). Research on the factors impacting passenger satisfaction specifically in inland waterway transportation, particularly from the perspective of a developing nation like Bangladesh, is, however, seriously lacking.

To fill this vacuum, a study was done that focused exclusively on the Dhaka-Barishal river route and looked at the factors that affect passenger satisfaction with waterway transportation. The results of this study are intended to help launch owners and policymakers understand how to better the quality of service offered by launch vessels and improve the experience of passengers. It is possible to take the proper steps to remedy any issues and raise the general level of excellence of canal transportation services by recognizing the elements that affect passenger happiness, such as safety precautions, affordability, accessibility, comfort, and timeliness.

In conclusion, Bangladesh's transportation system relies heavily on inland water transport since it offers a convenient and economical choice for both people and commodities. Although there are advantages to water transportation in terms of cost and safety, there are issues with service quality. Policymakers and launch owners can seek to improve the general passenger experience and elevate the quality of service in waterway transportation by researching the factors influencing passenger satisfaction with the level of service. This would ultimately benefit the people of Bangladesh.

1.2 Objectives of the Study

The main objectives of the study are:

1. The objective of this study is to assess customer satisfaction with launch services on the Dhaka-Barishal route by conducting a questionnaire survey. The survey will collect feedback on various aspects such as overall service quality, comfort, price, accessibility etc.
2. This research aims to enhance the quality of launch services, improve passenger satisfaction, and provide an enhanced overall experience. This will be achieved by conducting a comprehensive investigation into areas that require improvement, including onboard facilities, comfort, price, accessibility, timeliness, cleanliness, and employee behavior. By addressing these factors, we seek to improve service quality and increase passenger satisfaction.

1.3 Previous Studies and Research Gap

The service quality and shortcomings of marine passenger ships on the Dhaka-Barishal river route were investigated in a 2016 study by Md. Minhajul Islam Khan from BUET. But that data is now outdated as, the Padma Bridge, among other recent improvements in roads and bridges, as well as the effect of COVID-19 is not reflected in the data, which was gathered in 2014, almost a decade ago.

We are conducting a new study to evaluate the condition of passenger service quality on the Dhaka-Barishal route in Bangladesh to close this gap after the construction of the Padma Bridge. This study will advance knowledge of the quality of the current passenger service provided on the Dhaka-Barishal route through the collection and analysis of data. The results will help launch owners, policymakers, and stakeholders identify areas for further improvement and ensure that the launch services fit travelers' changing expectations in light of road infrastructure improvements.

1.4 Thesis Outline

This thesis consists of five chapters in total. A brief overview of them is presented below:

Chapter 1: Introduction – This chapter has an overview of the topic, presents the objectives, significance and an outline of the study.

Chapter 2: Literature Review- This chapter contains a summary and evaluation of existing research and scholarly literature, which has provided the research methodology and analysis.

Chapter 3: Methodology - This chapter consists of the data collection procedure and a description of the model used to analyze the data.

Chapter 4: Results and Analysis - This chapter shows the findings derived from the analysis of the collected data and its interpretation.

Chapter 5: Conclusion & Recommendations - This chapter discusses the research's limitations, and provides recommendations for future research or practical applications based on the study's outcomes.



Figure 1: People Boarding Launches at Sadarghat Launch Terminal



Figure 3: Typical Large Sized Dhaka-Barishal Launch



Figure 2: Passengers Gathering at Sadarghat Launch Terminal



Figure 5: Typical Deck Seating Area in a Dhaka-Barishal Launch



Figure 4: People Booking Places on Deck by Using Bags or Luggage

Chapter 2: Literature Review

2.1 Service Quality Models

2.1.1 Service Quality Gap Model of Parasuraman, Zeithaml, and Berry (1985)

According to this study, businesses may be able to provide exceptional service if they can narrow the gap between client perceptions and expectations (Parasuraman et al.1985). This method is fairly objective and compares customers' perceptions during and after a service experience compared to their prior expectations in what is known as the expectancy-disconfirmation paradigm, which is similar to customer satisfaction measurement comparing "pre-event expectations" and "post-event evaluations." This conceptual model of service quality, which describes how four other operational "gaps" create an overall difference or "gap" between expected service and observed service, has been utilized in many studies like Mentzer et al. (2001), Grant (2004) and Rafiq & Jaafar (2007).

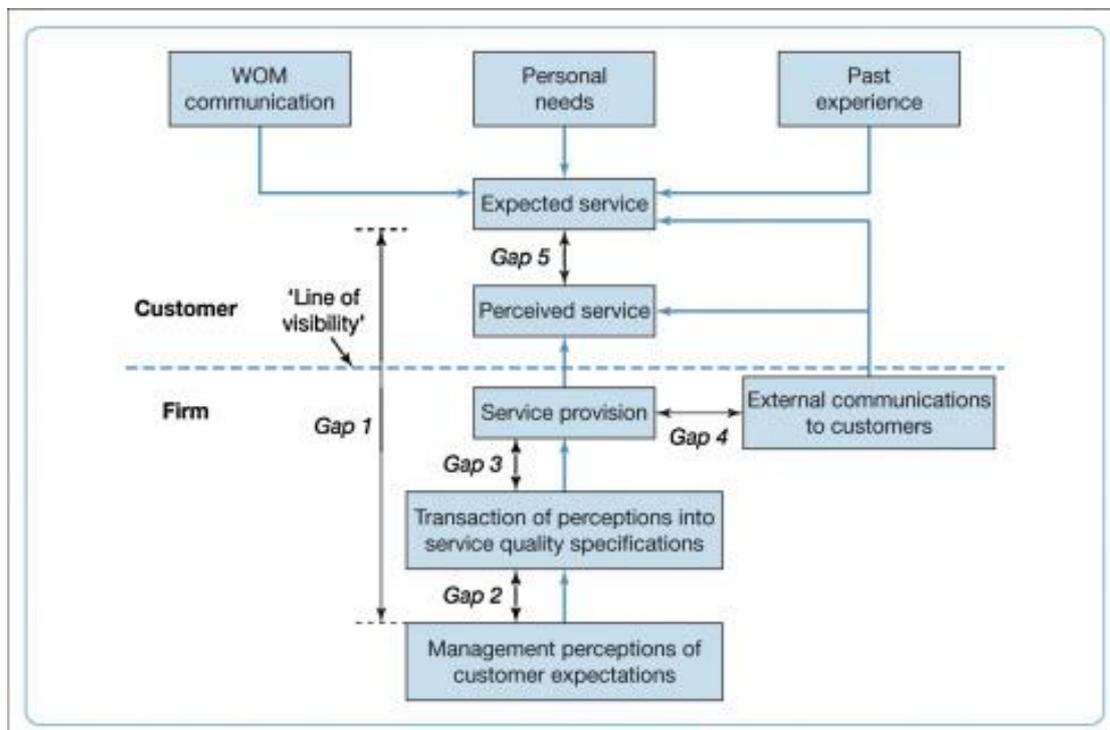


Figure 6: Service Quality Gap Model

Source: Parasuraman et al.1985

2.1.2 The SERVQUAL model of Parasuraman, Zeithaml, and Berry (1988)

In the vast tapestry of human existence, where compassion and understanding intertwine, let us embark on a heartfelt exploration, delving into the depths of knowledge. At the core of our discussion lies SERVQUAL, a remarkable research model meticulously conceived to measure the intricate concept of service quality. Born out of a deep desire to grasp the essence of consumer experiences, this model artfully captures their multifaceted expectations and perceptions.

Within the intricate framework of SERVQUAL, five dimensions emerge, each one shedding light on a crucial aspect of service quality. Tangibles, the first dimension, embraces the tangible elements that shape the customer's encounter with a service provider, encompassing the physical aspects that can be seen, touched, or experienced. From the atmosphere of a hotel lobby to the presentation of a product, these tangibles leave a lasting impression on the discerning customer.

Reliability, the second dimension, encapsulates the vital pillar of trust and consistency in service delivery. It speaks to the customer's reliance on the service provider to deliver as promised, without unexpected delays or deviations. The assurance of reliable service builds the foundation of a lasting relationship between the provider and the customer, fostering loyalty and satisfaction.

Responsiveness, the third dimension, shines a light on the timeliness and attentiveness exhibited by the service provider in addressing customer needs. A swift response, coupled with genuine care and attentiveness, nurtures a sense of importance and acknowledgement within the customer, enhancing their overall service experience.

The fourth dimension, assurance, revolves around instilling confidence and trust in the customer regarding the service provider's competence, knowledge, and credibility. Through professional demeanor, expert guidance, and the conveyance of a sense of security, the service provider reassures the customer that they are in capable hands, fostering a sense of comfort and peace of mind.

Finally, the dimension of empathy holds a special place within the SERVQUAL model. It captures the essence of understanding, compassion, and genuine concern for the customer's

unique circumstances and emotions. By actively listening, demonstrating empathy, and tailoring the service experience to individual needs, the provider cultivates a deep connection, creating an atmosphere of care and support.

This comprehensive research model, known as SERVQUAL, stands as a testament to the intricate interplay between service quality and human emotions. It serves as a guiding compass for service providers, empowering them to enhance their offerings and create transformative experiences that resonate deeply with their customers (Parasuraman et al.1985).

2.1.3 The SERVPERF performance-based evaluation model of Cronin and Taylor (1992)

In the vast tapestry of our shared humanity, let us embark on a compassionate journey of exploration, as we delve into the profound essence of the SERVPERF model. Developed by the visionary minds of Cronin and Taylor, this model stands as a beacon of practicality and user-friendliness, offering a valuable framework for evaluating service quality.

At its core, the SERVPERF model is rooted in a deep understanding of the importance of actual outcomes and performance when gauging service excellence. It recognizes that true quality lies not solely in promises and perceptions but in tangible results that meet or exceed customer expectations. By prioritizing the customer's desired service level, this model embraces a customer-centric approach, ensuring that the focus remains on delivering exceptional experiences.

Within the rich framework of the SERVPERF model, several key aspects come to the forefront. Productivity takes center stage, emphasizing the efficient and effective use of resources to achieve optimal service delivery. Through streamlined processes and a commitment to operational excellence, service providers can maximize productivity and offer swift, seamless experiences to their valued customers.

Quality, another vital aspect, is deeply woven into the fabric of the SERVPERF model. It recognizes that excellence is not a mere afterthought but an integral part of every stage of the service encounter. By fostering a culture of continuous improvement, embracing best practices, and setting rigorous quality standards, service providers can consistently deliver experiences that leave a lasting impact on their customers.

Flexibility, the third key aspect highlighted by the SERVPERF model, acknowledges the ever-changing dynamics of the service landscape. In today's fast-paced world, adaptability and responsiveness are crucial. By being agile and open to adjusting service offerings based on evolving customer needs and market trends, service providers can stay ahead of the curve and remain relevant in a competitive environment.

Drawing upon the groundbreaking work of Boljwin and Kumpe (1990), the SERVPERF model stands as a testament to the harmonious blend of human empathy and service excellence. It serves as a guide, empowering service providers to navigate the complexities of delivering exceptional service, where customer satisfaction and business success intertwine.

In our collective pursuit of service excellence, the SERVPERF model reminds us of the profound impact that a practical and user-friendly approach can have on elevating the customer experience to new heights. By embracing this holistic framework and embodying its principles, service providers can forge lasting connections with their customers, leaving an indelible mark on their hearts and minds.

2.2 Service Quality Factors

The following factors are based on SERVQUAL and SERVEPERF models:

2.2.1 Punctuality

Punctuality falls under the dimension of reliability. Passengers always prefer to arrive at their destination on time. The survey in Stockholm and Brisbane on transport satisfaction by the regular public depicts that the on-time performance of the boat satisfied the passenger most, along with comfort (Stockholm County Council, 2013; Translink, 2016). Schedule timetables, accessibility, and announcement systems directly correlate with passenger satisfaction (Tong et al., 2015).

2.2.2 Safety Facilities

Insufficient safety regulations and materials, such as personal protective equipment, life jackets, and safety harnesses, contribute to frequent marine accidents, lowering the service

quality of water vessels. (Mia et al., 2021). Limited availability, dysfunctional equipment, and a lack of trained crew members to utilize breathing devices, fire extinguishers, lifeboats, and emergency medical equipment pose significant safety risks and contribute to a decline in service quality for passengers (“How to Take Care of Personal Safety on Ships?”, 2018). Safety is under the dimension of tangibility.



Figure 7: Unsafe Practices by Passengers



Figure 8: Safety Floaters on Launch

2.2.3 Staff Characteristics

In a study, staff attitude and behavior were ranked highest in terms of relative relevance under responsiveness, assurance, and empathy dimensions. This indicates that the behavior of staff members, including politeness, friendliness, productivity, and skill levels, can significantly impact customer satisfaction levels.. (Hasan & Karmaker, 2019). Another survey in Lucknow City, India, shows that well behavior from drivers and the staff increases passenger satisfaction (Singh, 2016).

2.2.4 Comfort

Comfort plays a vital role in enhancing service quality. A study on cab taxi service in Cape Coast, Ghana, found that comfort had the strongest correlation among six variables. This includes comfortable seats, well-maintained vehicles, and proper air circulation (Horsu & Solo, 2015). Similarly, a survey on passengers using the launch service from Dhaka to Barisal highlighted the significance of comfort and hygiene in customer satisfaction (Hasan & Karmaker, 2019)



Figure 9: Passengers' Seating Area on the Deck of the Launch

2.2.5 Harassment

Passenger harassment significantly impacts service quality. A recent study interviewed 2,500 women across all districts of Bangladesh, revealing that 90% of women and girls have encountered sexual harassment while using public transportation. This unpleasant experience often leads them to avoid such services (Ferdous & Dipu, 2019).

2.2.6 Cleanliness

In a survey of boat users in Stockholm, cleanliness and punctuality were rated as highly important (Tanko et al., 2019). Similarly, a study by Singh (2016) found that passenger satisfaction is strongly influenced by a clean environment inside the vehicle. Passenger preferences often prioritize cleanliness over factors like cost, service frequency, and station amenities.

Chapter 3: Methodology

3.1 Introduction

This chapter details the data collection procedure, data formulation, and the methodology employed to assess the service quality of launches. The Poisson and Negative Binomial Models were utilized to identify the significant factors influencing passengers' perception of service quality. This model formulation aids in achieving the primary objectives of the study.

3.2 Area of Study

This research focuses on the Shadarghat Launch Terminal in Dhaka and the Barishal Launch Terminal in Barishal. These transportation hubs are integral to river-based travel, connecting various regions in the country. By studying these terminals, the research aims to gain insights into their operations, efficiency and overall service quality and customer satisfaction levels.

3.3 Preparation of Questionnaire

The questionnaire survey was developed to find out the characteristics of the passenger and any factors that might influence the service quality of the launches. While preparing the survey previous literature, pilot surveys, and local context was taken into account. A total of two pilot surveys were conducted before the list of final questions was ready. The survey mainly consisted of three parts. Firstly the questions related to the socioeconomic and travel characteristics of the passengers were considered. The next part collected data on the travel experience of the passengers. The data collected in these two parts were considered to be the independent variables and consisted of 30 questions. The final part of the questionnaire consisted of the evaluation of different service quality indicators or factors as perceived by the passengers. These served as dependent variables in the analysis phase.

3.4 Data Collection

Data was collected through face-to-face interviews. It was collected from a total of 260 respondents at the launch terminals of Dhaka and Barishal. The focus was primarily on passengers actively boarding the launches, ensuring a representative dataset.

To capture a diverse range of perspectives, visits to the locations were made on different days and hours. Rigorous measures were taken to safeguard the data, with regular backups and uploads to a cloud storage to prevent any loss or corruption. The survey included thirty independent variables, categorized based on the passengers' socioeconomic, demographic, and travel characteristics.

The latter part of the survey focused on six dependent variables: comfort, punctuality, cleanliness, safety, staff characteristics, and harassment. Participants rated their perception of these variables on a scale of 1 to 5, with 1 indicating the lowest satisfaction level and 5 representing the highest.

This meticulous data collection approach aimed to gather comprehensive information on passenger experiences and perceptions, enabling a detailed analysis of the factors influencing service quality in the context of launch travel on the Dhaka-Barishal route.

3.5 Model Development

The Negative binomial model and Poisson models were used to determine the variables, which affected the service quality significantly. Stata 15 software was used to run the models.

The use of the Poisson and Negative Binomial model allows for an accurate estimation of the relationship between the independent variables (such as socioeconomic and demographic factors) and the dependent variables (comfort, punctuality, cleanliness, safety, staff characteristics, and harassment). It provides a robust framework to investigate the significant factors influencing passengers' perception of service quality, accounting for any potential excess variation in the data.

This model was chosen due to its suitability for analyzing count data in cases where the data is discrete and non-negative. For the dependent variables, the response values of all the questions (model specific) will be summed up. A total of 6 dependent variables were considered resulting in 6 models. For independent variables, all of them will be coded in binary format. A total of 30 independent variables were considered.

The equation for the Poisson model is:

$$\Pr(n_{it} | \mu_{it}) = \frac{\exp(-\mu_{it}) \mu_{it}^{n_{it}}}{n_{it}!} \quad (1)$$

Where, $\Pr(n_{it})$ is the probability of the outcome of perceived service quality by passenger i in a given time t

μ_{it} is the expected outcome of perceived service quality by individual passenger i in a given time t

The equation for negative binomial is:

$$\Pr(n_{it} | \mu_{it}, k) = \frac{\binom{n_{it} + 1/k - 1}{n_{it}} \left(\frac{k\mu_{it}}{1 + k\mu_{it}} \right)^{n_{it}} \left(\frac{1}{1 + k\mu_{it}} \right)^{1/k}}{(1/k)n_{it}!} \quad (2)$$

The parameter "k," where k is greater than 0, is often called the over dispersion parameter. The negative binomial model reduces to the Poisson model when k approaches zero. The Poisson regression model is part of the negative binomial model, and a t-test with $k = 0$ can be used to determine the presence of significant over-dispersion in the data.

Stata 15 was chosen as the preferred software for Poisson and Negative Binomial models due to its comprehensive statistical analysis capabilities, efficient computation, built-in diagnostics, graphical visualization, and user-friendly interface. It provides dedicated commands and tools specifically designed for count data analysis, making it easier to implement and interpret these models accurately.

3.6 Collected Data

The following table shows the summary statistics and explanations of the collected data consisting of the independent and dependent variables. The mean values and standard deviation of the collected data is also provided in the table alongside an explanation or description of the variables.

Table 1: Summary and Explanation of Collected Data

Variables	Description of Variables	Mean	Std. Dev.
Socioeconomic & Travel Characteristics			
Gender	Male=1; Female=0	0.762	0.427
Marital Status	Married=1; Unmarried=0	0.577	0.495
Private vehicle ownership	Yes=1; No=0	0.077	0.267
Family members use this service	Yes=1; No=0	0.085	0.279
Drive car	Yes=1; No=0	0.069	0.254
Age			
Age less than twenty	If age is < 20=1; otherwise=0	0.012	0.107
Age twenty to forty	If age is ≥ 20 but <40=1; otherwise=0	0.188	0.392
Age forty to sixty	If age is ≥ 40 but ≤60=1; otherwise=0	0.319	0.467
Age greater than sixty	If age is >60 = 1; otherwise=0	0.238	0.427
Education			
Uneducated	If education is Uneducated=1; otherwise=0	0.012	0.107
Primary	If education is Primary =1; otherwise=0	0.188	0.392
SSC	If education is SSC=1; otherwise=0	0.319	0.467
HSC	If education is HSC=1; otherwise=0	0.238	0.427
Graduate	If education is Graduate=1; otherwise=0	0.242	0.429
Monthly Income			
Income less than 15,000	If income is < 15,000=1; otherwise=0	0.327	0.47
Income 15,000 to 25,000	If income is ≥ 15,000 but <25,000=1; otherwise=0	0.408	0.492
Income 25,000 to 40,000	If income is ≥ 25,000 but <40,000=1; otherwise=0	0.227	0.42
Income more than 40,000	If income is ≥40,000 = 1; otherwise=0	0.038	0.193
Profession			
Businessman	If Businessman=1; otherwise=0	0.2	0.401
Office Job	If Office Job=1; otherwise=0	0.288	0.454
Student	If Student=1; otherwise=0	0.1	0.301
Farmer	If Farmer=1; otherwise=0	0.085	0.279
Others	If Others=1; otherwise=0	0.327	0.47
Major Mode of Travel			
Bus	If Bus=1; otherwise=0	0.531	0.5
Rickshaw	If Rickshaw=1; otherwise=0	0.181	0.386
Bicycle	If Bicycle=1; otherwise=0	0.088	0.285
Other	If Other =1; otherwise=0	0.2	0.401
Mode to Reach Launch Station			
Bus	If Bus=1; otherwise=0	0.354	0.479

Cng	If Cng=1; otherwise=0	0.292	0.456
Rickshaw	If Rickshaw=1; otherwise=0	0.131	0.338
Others	If Others=1; otherwise=0	0.223	0.417
Home Location			
Barishal	If Barishal=1; otherwise=0	0.481	0.501
Borguna	If Borguna=1; otherwise=0	0.092	0.29
Pirozpur	If Pirozpur=1; otherwise=0	0.077	0.267
Others	If Others=1; otherwise=0	0.35	0.478
Purpose of Travel			
Home visit	If purpose is Home visit=1; otherwise=0	0.404	0.492
Recreation	If purpose is Recreation=1; otherwise=0	0.223	0.417
Job Purposes	If purpose is Job Purposes=1; otherwise=0	0.131	0.338
Others	If purpose is Others=1; otherwise=0	0.242	0.429
Job Location			
Dhaka	If job location is Dhaka=1; otherwise=0	0.242	0.429
Barishal	If job location is Barishal=1; otherwise=0	0.135	0.342
Narayanganj	If job location is Narayanganj=1; otherwise=0	0.115	0.32
Others	If job location is Others=1; otherwise=0	0.508	0.501
Number of Family Members			
One to Three	If family members(s) ≥ 1 but $<4=1$; otherwise=0	0.023	0.15
Four to Six	If family members ≥ 4 but $<7=1$; otherwise=0	0.085	0.279
More than Six	If family members >6 ; otherwise=0	0.892	0.311
Monthly Budget for Transportation			
Less than one thousand	If spend is ≥ 0 but $<1000=1$; otherwise=0	0.323	0.469
One thousand to two thousand	If spend is ≥ 1000 but $\leq 2000=1$; otherwise=0	0.392	0.489
More than two thousand	If spend is > 2000 ; otherwise=0	0.285	0.452
Frequency of Water Transport Use			
Biweekly	If used biweekly=1; otherwise=0	0.065	0.248
Monthly	If used monthly=1; otherwise=0	0.162	0.369
Every 3 months	If used every 3 months=1; otherwise=0	0.538	0.499
Every 6 months	If used every 6 months=1; otherwise=0	0.158	0.365
Yearly	If used yearly=1; otherwise=0	0.077	0.267
Travel Experience Based Questions			
Involved in launch accident	Yes=1; No=0	0.223	0.417
Experienced harassment	Yes=1; No=0	0.146	0.354
Experienced launch breakdown	Yes=1; No=0	0.296	0.457
Experienced pickpocketing	Yes=1; No=0	0.238	0.427

Experienced motion sickness	Yes=1; No=0	0.154	0.361
Satisfaction with ticket system	Yes=1; No=0	0.531	0.5
Satisfaction with price	Yes=1; No=0	0.369	0.484
Minimization of travel time	Yes=1; No=0	0.223	0.417
Reserved seating area for women	Yes=1; No=0	0.785	0.412
Overall Service of Launch			
Very good	If service is very good=1; otherwise=0	0.158	0.365
Good	If service is good=1; otherwise=0	0.358	0.48
Average	If service is average=1; otherwise=0	0.323	0.469
Poor	If service is poor=1; otherwise=0	0.127	0.334
Very poor	If service is very poor=1; otherwise=0	0.035	0.183
Main Problem of Water Vessel			
Untimely	If main problem is untimely=1; otherwise=0	0.254	0.436
Uncomfortable	If main problem is uncomfortable=1; otherwise=0	0.231	0.422
Expensive	If main problem is expensive=1; otherwise=0	0.154	0.361
Others	If main problem is other=1; otherwise=0	0.362	0.481
Reasoning for Choosing Water Transportation			
Comfortable	If reason is comfortable=1; otherwise=0	0.504	0.501
Reliable	If reason is reliable=1; otherwise=0	0.188	0.392
Safe	If reason is safe=1; otherwise=0	0.092	0.29
Avoid Traffic	If reason is avoid traffic=1; otherwise=0	0.1	0.301
Others	If reason is other=1; otherwise=0	0.115	0.32

Chapter 4: Results and Analysis

4.1 Results

The following table shows the results of six models based on six considered components of service quality. Variables with at least a ninety percent confidence interval have been considered. Here a negative value of z means more likely to have lower perceived service quality while a positive value represents a higher perceived service quality level.

Table 2: Estimated Negative Binomial Model in terms of Service Quality

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Comfort	Safety Facilities	Staff Characteristics	Punctuality	Harassment	Cleanliness
No. of obs.	260	260	260	260	260	260
First Value = z value, Second Value = [p value]						
Socioeconomic & Travel Characteristics						
Gender	5.98 [0.000]	-	2.7 [0.007]	2.54 [0.011]	9.38 [0.000]	-
Marital Status	-	-	-3.06 [0.002]	-	-	-
Own Vehicle	-3.29 [0.001]	-	-	2.73 [0.006]	-	-
Age						
<20	-	-	-	7.5 [0.000]	-	-
20-40	1.78 [0.076]	-	-	7.5 [0.000]	-	-
40-60	-	-	-	3.39 [0.001]	-	-
Education						
Uneducated	-	2.84 [0.005]	2.13 [0.033]	-	-	4.77 [0.000]
Primary	-	-	5.36 [0.000]	-	-	10.39 [0.000]
SSC	-	-	4.60 [0.000]	-	-	8.92 [0.000]
HSC	-	-	5.3 [0.000]	-	-	7.90 [0.000]
Graduate	-2.62 [0.009]	-	-	-	-	-
Monthly Income						
< 15,000	-	-	3.06 [0.002]	-	-	-2.18 [0.029]
15,000 - 25,000	3.7 [0.000]	1.91 [0.056]	-	-	-	-

>40,000	-	-	-	-2.76 [0.006]	-	-
Profession						
Businessman	-	-	-	-	-1.61 [0.107]	-
Student	-	-	-	1.87 [0.062]	-	-
Mode to Reach Launch Station						
Bus	-	-	-	-	2 [0.045]	-
CNG	-	2.49 [0.013]	-	-1.75 [0.080]	-	-
Rickshaw	-	-	1.71 [0.088]	-	-	-
Home Location						
Barishal						-2.11 [0.035]
Borguna	-	1.67 [0.096]	-	-2.86 [0.004]	-	-
Purpose of Travel						
Home Visit	-	-	-	2.19 [0.028]	-	-
Recreation	-1.61 [0.108]	-	-	-	-1.62 [0.105]	-
Job Purposes	-	-	-	1.95 [0.051]	-	-
No of Family Members						
1 to 3	-1.96 [0.050]	2.94 [0.003]	-	-	-	-
More than 6	-	4.48 [0.000]	-	-	-	-
Frequency of Water Transport Use						
Every 3 Months	-	-	-2.12 [0.034]	-	-	-1.83 [0.067]
Yearly	-	-3.94 [0.000]	-	-	1.9 [0.058]	-
Travel Experience Based Questions						
Experinced Accident	-	-2.56 [0.010]	-1.82 [0.068]	-	-	-
Break Down of Launch	2.22 [0.026]	-2.27 [0.023]	-	-	-	-
Motion Sickness	-	-	-	-	-2.06 [0.039]	-
Satisfied Ticket System	-	-	-	-	3.49 [0.000]	-
Satisfaction with Price	-1.68 [0.094]	1.94 [0.052]	-	-	-1.96 [0.050]	-
Travel Time Minimized	2.9 [0.004]	-1.84 [0.066]	-	2.18 [0.029]	-	-1.81 [0.070]
Reserved Women Seats		-2.80 [0.005]	-	3.27 [0.001]	-	-

Overall Service of Launch						
Very Poor	-2.16 [0.031]	-	-	3.79 [0.000]	-	-
Main Problem of Water Vessel						
Untimely	-	-	-	-1.88 [0.060]	-	-
Reasoning for Choosing Water Transportation						
Comfort	4.20 [0.000]	-	-	-	-	-
Avoid Traffic	-	-	-	-	-1.65 [0.101]	-
Others	-	2 [0.045]	-	-	-1.95 [0.051]	-

4.2 Analysis of Results

4.2.1 Gender

Upon conducting a thorough examination, we made a noteworthy observation: male passengers tend to experience a greater sense of satisfaction when it comes to service quality. This phenomenon is particularly evident when we consider key factors such as Comfort ($z = 5.98$), Staff characteristics ($z = 2.7$), Punctuality ($z = 2.54$), and Harassment ($z = 9.38$) models, where gender emerges as a statistically significant determinant. Delving deeper into the reasons behind this discrepancy, we find that males generally exhibit a higher level of tolerance when confronted with less-than-ideal conditions. It seems that they are more inclined to accept and adapt to situations that may be perceived as subpar by others. Moreover, another contributing factor could be the disparity in instances of harassment experienced by male and female passengers. Regrettably, it is often females who encounter a higher frequency of such incidents, while males face comparatively fewer occurrences. This disparity could potentially contribute to the divergent levels of satisfaction between the genders.

4.2.2 Marital Status

Upon close examination, a significant finding emerges: married individuals tend to perceive lower levels of service quality ($z = -3.06$). This intriguing observation suggests that marital status plays a crucial role in shaping one's perception of the services provided. It is worth noting that this phenomenon may be influenced by a variety of factors, such as differing expectations or responsibilities that come with married life.

4.2.3 Vehicle Ownership

Furthermore, an interesting correlation comes to light when considering vehicle ownership and perceived service quality. Those who own vehicles enjoy the advantage ($z = 2.73$) of easy access to the launch, which in turn contributes to a higher perception of service quality. This connection can be attributed to the convenience and convenience of having a personal vehicle at one's disposal, eliminating the need to rely on external means of transportation. Consequently, vehicle owners tend to have a more favorable impression of the services provided, owing to their seamless and hassle-free experience.

4.2.4 Age Groups

Upon a comprehensive analysis, a noteworthy trend emerges concerning different age groups and their perception of service satisfaction. Specifically, individuals belonging to the twenty to forty age group exhibit a higher level of contentment when it comes to two critical aspects: Comfort ($z = 1.78$) and Punctuality ($z = 7.5$).

The significance of this finding lies in the fact that younger children and older individuals tend to be less tolerant of harsher environments. As age increases, so does vulnerability, making them more sensitive to discomfort and less forgiving of any delays or inconveniences they may encounter during their travel experience. Therefore, it is understandable that these age groups might express lower levels of satisfaction when it comes to factors such as Comfort and Punctuality.

On the other hand, the twenty to forty age group, encompassing individuals in their prime adulthood, appears to have a higher threshold for tolerating less-than-ideal conditions. Their ability to adapt and adjust to various circumstances allows them to perceive higher levels of comfort and punctuality, even in less optimal situations. Consequently, their overall satisfaction with the services provided is relatively higher compared to younger and older age groups.

It is important to consider the diverse needs and expectations of different age groups when designing and improving service quality. By catering to the specific requirements of each age demographic, service providers can enhance overall customer satisfaction and ensure a more positive travel experience for all.

4.2.5 Education

A comprehensive analysis of the data reveals an intriguing trend regarding the relationship between education level, income, and perceived service quality. Graduates, who typically have a stable source of income, tend to possess higher expectations when it comes to service quality. Consequently, this higher level of expectation often leads to a lower perception of service quality, as indicated by the results from the Comfort model ($z = -2.62$).

In contrast, uneducated or less-educated individuals, who often have lower incomes, tend to have lower expectations. This is reflected in their higher levels of satisfaction with the provided service quality. Notably, similar findings are observed regarding Safety ($z = 2.84$), Staff Characteristics ($z = 2.13$), and Cleanliness ($z = 4.77$) for uneducated individuals.

Moreover, the positive z-values in the result table indicate that primary, SSC, and HSC level students also display higher levels of satisfaction with the provided service quality. It can be inferred that these students, who are still pursuing their education, may have lower expectations due to their current academic focus. Consequently, the service quality provided may meet or exceed their expectations, resulting in a positive perception of the services.

These findings highlight the significance of considering the education level and income of passengers when assessing service quality. Understanding the varying expectations of different groups can help service providers tailor their offerings to meet the specific needs and preferences of each demographic. By doing so, they can strive to enhance overall customer satisfaction and provide a more fulfilling experience for all passengers.

4.2.6 Monthly Income

By delving deeper into the analysis, a significant pattern emerges regarding the relationship between income levels, expectations, and perceived service quality. High-income passengers, owing to their greater affordability, tend to have higher expectations in terms of comfort. They anticipate amenities such as upgraded seating options and more spacious facilities within the seating areas. Consequently, when their expectations are not met, their perception of service quality may be negatively impacted. This is evident from the statistical analysis, where the high-income group exhibits a reverse trend with a negative z-value ($z = -2.76$).

On the other hand, low-income individuals, who may not have the same financial means to demand luxurious amenities, often express higher levels of satisfaction with the provided service quality. Their expectations are more aligned with the available offerings, and they appreciate the value derived from the service despite potential limitations. This is reflected in the statistical analysis, where the low-income group demonstrates a positive z-value ($z = 3.06$), indicating their elevated satisfaction with the services provided.

These findings underscore the role of affordability and expectations in shaping perceptions of service quality. It is crucial for service providers to take into account the diverse income levels of their passengers and tailor their offerings accordingly. By understanding the differing needs and preferences of different income groups, providers can strive to strike a balance that meets the expectations of all passengers. This approach contributes to an overall enhanced customer experience, fostering greater satisfaction and loyalty among passengers, regardless of their income level.

4.2.7 Profession

Upon conducting a comprehensive analysis, an interesting trend emerges concerning the relationship between profession, expectations, and perceived service quality. Businessmen, driven by their demanding professional roles and expectations of efficiency, tend to have higher expectations when it comes to the services provided ($z = -1.61$). Their reliance on prompt and top-notch services as part of their business endeavors shapes their perception of service quality.

In contrast, students, who often have limited financial resources, may have lower expectations due to their comparatively lower affordability. This could be attributed to their reliance on more budget-friendly options. As a result, they may be more accepting of any potential shortcomings or limitations in the services provided. This disparity in expectations between businessmen and students, based on their respective professions and financial capabilities, has a notable impact on their perceived service quality.

4.2.8 Frequency of Travel

Interestingly, frequent users of launch services demonstrate lower satisfaction levels ($z = -2.12$) compared to infrequent travelers ($z = 1.9$). This finding suggests that the frequency of travel plays a significant role in shaping one's evaluation of service quality. A possible explanation is

that frequent travelers may experience a sense of monotony, diminishing the novelty and excitement associated with each journey and leading to reduced satisfaction. In contrast, individuals who travel less frequently approach each trip with a fresh perspective, potentially resulting in a more positive perception of the services provided.

4.2.9 Travel Experience

Careful examination reveals a notable finding concerning individuals who have experienced accidents ($z = -2.56$) or launch breakdowns ($z = -2.27$) in the past. It is evident that these individuals tend to exhibit lower levels of satisfaction when it comes to the safety measures implemented by the service provider. The psychological impact of their previous traumatic experiences makes them more cautious and critical when evaluating safety measures.

4.2.10 Main Advantage and Disadvantage of Choosing Launch Service

The findings of this study shed light on crucial aspects related to the service quality of transportation modes. One significant factor contributing to the deterioration in service quality is the failure to maintain a proper timetable ($z = -1.88$). Timeliness and adherence to schedules are essential for ensuring a smooth and efficient travel experience. When the timetable is not followed, it can lead to delays, inconvenience, and a decrease in overall service quality.

On a positive note, comfort ($z = 4.20$) emerges as a key influencing factor for individuals choosing this mode of transportation to travel from Dhaka to Barishal. The level of comfort provided plays a pivotal role in attracting passengers and enhancing their travel experience. Passengers value amenities, spacious seating, and a pleasant atmosphere that contributes to their overall comfort during the journey. By prioritizing and maintaining high standards of comfort, transportation providers can cater to the preferences and needs of passengers, ultimately increasing satisfaction levels.

These findings underscore the significance of maintaining a proper timetable to ensure punctuality and efficiency in transportation services. Additionally, they highlight the importance of investing in and prioritizing comfort to attract and retain passengers. By addressing these factors, service providers can enhance the overall service quality, improve customer satisfaction, and establish a positive reputation in the transportation industry.

Chapter 5: Conclusion & Recommendations

5.1 Key Findings

The evaluation of service quality in inland water transport between Dhaka and Barishal revealed numerous influential factors. Passenger perceptions regarding service were significantly influenced by a range of variables, including gender, marital status, vehicle ownership, age group, education level, income level or profession along with trip purpose, past experiences and travel frequency among others.

Male passengers expressed greater satisfaction and those with higher education reported lower levels of perceived service quality. The ownership of vehicles correlated with a more positive perception, possibly due to the ease and availability of the launch. In terms of age groups, those between 20 and 40 years old showed higher satisfaction regarding comfort and punctuality, highlighting the significance of considering diverse age preferences and tolerance levels. Individuals with higher incomes perceived less comfort, implying that affordability and access to premium services influence their assessment of service quality. Occupation has an impact, with businessmen perceiving lower service quality compared to students, possibly due to their higher expectations. Recreational journeys had higher expectations for service quality, whereas routine trips to home or work had lower expectations. Regular travelers experienced a decrease in their perception of service quality, potentially stemming from a sense of monotony. Passengers who had previously encountered accidents or breakdowns had lower perceptions of safety, highlighting the necessity for enhanced safety measures.

Launches in the Dhaka-Barishal route face a significant challenge with untimely departures, as they currently only depart once a day in the evening. Despite this drawback, passengers are drawn to water transportation due to the comfort it provides. Unlike buses, where people are limited to their seats, launches allow people to wander around freely. These results underline how crucial it is to solve the problem of premature departures and enhance scheduling alternatives in order to satisfy the demand for a convenient and comfortable method of transportation.

In conclusion, this research study provides important insights into the variables that affect how customers evaluate the level of service provided by inland water transportation on the Dhaka-

Barishal route. Policymakers and service providers should prioritize passenger comfort for those with higher incomes and take into account the individual preferences of different genders. It is vital to put effort into enhancing safety procedures and regaining the trust of customers who have had bad experiences in the past. The inland water transportation system can be improved by concentrating on these areas in order to meet the various passenger expectations and deliver an all-around improved experience.

5.2 Policy Implementation

The policy implementation proposal addresses the factors that influence passenger perceptions. The goal is to enhance passengers' overall experience and improve the service quality in the Dhaka-Barishal route. The policy recommendations outlined below consider passengers' diverse preferences and needs, aiming to provide a convenient, comfortable, and safe mode of transportation.

Some of our suggested policy implementation proposals are:

1. Flexible Scheduling: It is suggested to introduce additional departures throughout the day on the Dhaka-Barishal route to stop untimely departure issues. Passengers will have greater convenience in planning their trips if there are more departure times.

2. Comfort Enhancement Initiatives: The following actions should be taken to prioritize passenger comfort: a. Make investments in enhancing the current releases with more comfortable seating arrangements, roomy interiors, and ergonomic designs. b. To increase general comfort, include features like air conditioning, charging connections, and onboard entertainment systems. b. Include specific rest spots inside the launching so that people may move around and stretch their legs while traveling.

3. Safety Measures and Trust Building: The following actions should be made to improve general safety and help passengers who have had bad experiences in the past regain their trust: a. To prevent accidents and breakdowns, enforce tougher safety requirements, such as routine maintenance checks, staff training programs, and adherence to safety standards. b. Increase awareness of safety precautions by prominently posting warnings and emergency contact details on the launchers. c. Create a feedback system that enables passengers to immediately

report safety-related issues or occurrences, ensuring their complaints are resolved quickly and openly.

4. Customer Education and Awareness: Implement the following strategies to meet the various attitudes and expectations of various passenger groups: a. Hold awareness campaigns and workshops to inform passengers on the amenities offered, safety procedures, and services offered in order to manage their expectations. b. Disseminate educational materials, such as booklets or online manuals, that describe the inland water transport system's offerings, timetables, and comforts. c. Create customized communication plans to speak to individual passenger groups, highlighting the advantages of using water transportation for their unique requirements and preferences.

5. Continuous Monitoring and Improvement: This method should involve polling passengers, conducting surveys on a regular basis, and researching information on how people perceive the level of service. Make the necessary changes and enhancements in light of the findings to guarantee ongoing improvement of the inland water transport system.

5.3 Limitations and Future Scope of Research

A significant rise in the number of routes is strongly advised in order to thoroughly assess the service quality on the Dhaka-Barishal route. Passengers will benefit from a significantly wider range of travel alternatives by significantly expanding the routes that are offered. This growth will result in a noticeable improvement in the launch service's overall level of customer service, guaranteeing that passengers will have a more positive and effective journey.

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