

Exploring Challenges and Opportunities in the Food Delivery Services: A study on Food Application in Market of Bangladesh

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Abstract: The burgeoning food delivery services market in Bangladesh has undergone rapid transformation, catalyzed by the proliferation of digital platforms offering convenience and accessibility. This research delves into the multifaceted dynamics of this industry, with a specific focus on food applications, shedding light on pivotal issues and opportunities. Integrating digital payment solutions, in tandem with the global shift towards a cashless economy, has further cemented the industry's significance, especially in the wake of the COVID-19 pandemic. This research employs a positivist approach and deductive methodology to explore food delivery services in Bangladesh. It utilizes a mono-method, questionnaire-based survey involving 100 participants, including consumers, delivery personnel, and restaurant partners. The study assesses various factors, including eco-friendliness, employment issues, and technology, while maintaining ethical standards. Findings provide valuable insights for the industry's growth and sustainability. While these factors undoubtedly contribute to the broader food delivery ecosystem, their potency in shaping the moment of receiving a food delivery in Bangladesh appears comparatively diminished. Prioritizing factors such as expeditious delivery, real-time tracking, and user-friendly interfaces emerges as pivotal. Additionally, addressing labor-related quandaries within the gig economy model becomes imperative. To this end, companies can focus on workers' rights, equitable compensation, and job security, bolstering both the welfare of delivery personnel and the industry's public image. Navigating the intricate labyrinth of regulatory challenges stands as a linchpin for long-term sustainability. This research empowers food delivery businesses, policymakers, and industry stakeholders, arming them with insights to optimize operations, elevate customer satisfaction, and instate sustainable practices within Bangladesh's distinctive food delivery landscape. These insights bear the potential to catalyze positive transformation, fostering industry growth, and economic prosperity while safeguarding the interests of both customers and workers.

Keywords: Food applications, market of Bangladesh, challenges, opportunities, food delivery services, Bangladesh, delivery experience, eco-friendly practices, employment issues, sustainability, gig economy, regulatory challenges, customer satisfaction, managerial implications, theoretical implications, digital payment, food safety, diversification, environmental sustainability.

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1. Introduction

In recent decades, the modern service industry has expanded swiftly due to developments in information and communication technology. According to recent statistics, the penetration of smartphones in Bangladesh has reached an impressive 50%, with a rapidly increasing number of people gaining access to the digital world (Bangladesh Telecommunication Regulatory Commission (BTRC, 2022). As Dhaka's population grows and its citizens adopt increasingly hectic lives, food delivery apps and websites have become indispensable. Bangladeshi food delivery services were delivering 25,000 orders each day. 90% of the industry in Bangladesh was made up of the four biggest players and those are HungryNaki and Foodpanda also Pathao and finally Shohoz Food (Bhattacharjee 2021). Amidst this shifting market, Foodpanda has risen to prominence as a premier site serving the many food preferences of the city's residents (Hasan 2022). Amidst this rapid growth, the food delivery services market in Bangladesh faces a range of challenges and opportunities. While consumers feel delight the convenience of having meals delivered to their doorstep, several logistical and operational hurdles must be

addressed to ensure the sustainability and efficiency of the industry (Chowdhury & Rahman, 2021, p. 80). In light of these developments, this study aims to explore into the details of the food delivery services market in Bangladesh.

This study's rationale lies to understand and address the unique challenges and opportunities facing the food delivery services market in Bangladesh. Despite the market's exponential growth, there is a need of comprehensive research that specifically delves into the details of food applications and their implications in the context of Bangladesh. By presenting a data-driven analysis of the challenges related to logistics, payment systems, and also market competition, as well as exploring opportunities for technological integration and sustainable practices, this research contributes to the academic knowledge base strengthen for group of people. Furthermore, as the food delivery services sector significantly contributes to the economy and employment generation, this study's findings are expected to aid policymakers in designing targeted strategies that maximize the sector's economic impact.

Despite the rapid growth and increasing popularity of food delivery services in Bangladesh, there remains a research gap in

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understanding the specific challenges and opportunities faced by the industry, especially concerning food applications. While general studies might provide better ideation into the broader food delivery landscape, a comprehensive examination of the unique dynamics, market forces, and operational hurdles within the context of Bangladesh is lacking. The research problem centers on the need to identify and analyze the precise challenges that hinder the seamless functioning of different food delivery applications in Bangladesh. Overall, the research problem or gap lies in the lack of a wide-ranging study that specifically focuses on the challenges and opportunities unique to food delivery applications in the dynamic and burgeoning market of Bangladesh. By bridging this particular gap, the research aims to provide valuable insights and practical recommendations that contribute to the sustainable growth and reform of the food delivery services sector in the country.

The aim is to explore challenges and opportunities focusing in the Food Delivery Services specially in Market of Bangladesh. The objectives of the research are: (a) To analyze opportunities in the food delivery services, particularly food applications, within the market of Bangladesh and (b) To investigate the challenges in the food delivery services, particularly food applications, within the market of Bangladesh. To achieve the objectives the following questions have been covered through this research: (a) What are the main challenges encountered by food delivery services in Bangladesh, specifically focusing on food applications? and (b) What are the potential opportunities for growth and improvement within the food delivery application market in Bangladesh?

The contribution of this research lies in its comprehensive exploration of the challenges and opportunities specific to the food delivery services market in Bangladesh, with a focus on different food applications. By analyzing statistical data and conducting in-depth research, the study presents valuable insights for different stakeholders, policymakers, and industry players. The practical strategies and recommendations resulting from this research have the potential to enhance operational efficiency, customer satisfaction, and sustainability within the food delivery ecosystem. Furthermore, by empowering different local businesses, fostering innovation, and shaping regulatory frameworks, the study aims to catalyze positive changes that not only benefit the industry but also have a significant positive economic impact, driving growth and employment generation. This paper has shown into different sections like literature review, designing methodology, analysis of those data, critical discussion and finally interpretation of the data that has been shown by getting help from different paper with accurate data sources.

2. Literature Review

2.1 Food Delivery Service

The concept of meal delivery services has attracted significant interest in recent years because of how quickly digital media and smartphone apps have developed. The term Online Food Delivery Service is often used to describe the process by which food ordered by users via online platforms is cooked and afterward delivered to their designated location (Li, Miroso et al. 2020). There are currently two categories of food delivery services available. One is delivery from restaurants to consumers such as McDonald's, Pizza Hut, Domino's, etc. are equipped with (Frederick and Bhat 2021, Nasir, Rahman et al. 2022). In an alternative strategy, restaurants have the option to use crowdsourcing logistics, which involves

engaging a network of independent contractors known as delivery persons or riders. This particular model offers an effective and cost-efficient method for facilitating meal delivery which is also known as delivery from online platform to consumer (Sun 2019). Additionally, (See-Kwong, Soo-Ryue et al. 2017) stated that the convenience and comfort associated with online meal ordering are considered to be very useful for consumers since it removes the inconveniences caused by unfavorable traffic conditions or inclement weather (Kimes 2011).

2.2 Food Delivery Service in Bangladesh

In several urban centers, including the capital city, as well as other significant locations inside Bangladesh, those who are proficient in using digital technology have the ability to conveniently request meal deliveries from renowned eateries and home-based enterprises. This can be accomplished by just utilizing a mobile application and swiping their fingers over the screen. HungryNaki, a pioneering platform that was introduced in 2013, facilitated the advent of online meal delivery services, marking a significant milestone in this domain. The application facilitates the residents of Dhaka in accessing and locating nearby dining establishments according to their preferences, while also providing the functionality to make orders on their behalf. Within a span of less than six months, Foodpanda accomplished a similar feat (Islam 2019). In subsequent years, more local and international enterprises, including as Pathao meal, Uber Eats, Shohoj Food, and e-Food, entered the online meal delivery service sector. However, consumers demand for food do not follow the clock, yet these traditional delivery services do not function in the late hours of the night (Jahan 2021).

2.3 Customer Experience and satisfaction on Online Food Delivery Service

In recent years people of Bangladesh experiencing food delivery service through online applications. Customer believe in perceived process and innovation. This factors increase their commitment and turns customer to reuse the delivery application (Ahn, 2022). A mathematical model was studied to identify customer experience and minimize delivery costs. That gives meal delivery faster as a expected outcome (Kumar et al., 2020(Khanam and Sakib 2020, Sakib, Rabbani et al. 2022, Mishra, Haider et al. 2023)). A study was dine to verify the actual service attributions of food delivery service applying SEM and PLSc to understand customer satisfaction and subsequent behavioural structures ordering food from online. (Fakfare, 2021). This study shows the relevant reason why customer will experience online food delivery (Nuharini and Purwanegara,2022). Customer satisfaction in food delivery service through application has been a interesting case in recent years also a popular phenomenon in Bangladesh (Ramos, 2022). People in our country also taking this facility to enjoy food from various places through app like FoodPanda,Hungrynaki.. Studies have highlighted various factors influencing satisfaction, app usability, delivery time, food quality and service time. Some studies in Bangladesh shows some empirical factors influence Consumer behaviour in food order in online or through applications. An empirical study by (Saad,2021) find some factors that people think in ordering food from online.

2.4 Exploring Potential Opportunities of Food Delivery Services

The opportunitybased understanding system guides both food businesses and researchers, shedding light on urbanites' motivations for embracing online food delivery (Hosen and

Tabassum, 2022). Collaborations between delivery services and local restaurants can create a win-win situation. Restaurants expand their customer base without extensive investments, while delivery platforms offer diverse dining options (Pillai, Kim et al. 2022). The significance of contactless services, accentuated by the COVID-19 pandemic, underscores the relevance of such technological advancements. The advancement of technology and increasing internet penetration in Bangladesh provide fertile ground for the growth of food delivery services. The convenience of smartphones and mobile apps has made online food ordering accessible, creating opportunities for platforms to tap into the expanding market (Islam, Arif et al., 2022). Bangladesh's rich culinary heritage offers a wide range of local and international cuisines, which food delivery services can leverage. Bangladesh's regulatory framework for good delivery service includes several aspects including transportation regulations, customs procedures, import/export laws, and consumer protection guidelines (Azmat and Coghill 2005). Such diversity allows consumers to explore various dining options, catering to traditional and global tastes (Nasir, Rahman et al. 2022). Furthermore, food delivery services can bridge the gap between urban and rural dining options, extending their reach to underserved or remote areas (Ramos, 2022). Moreover, these platforms have the potential to promote sustainable practices in the restaurant industry by encouraging eco-friendly packaging and responsible ingredient sourcing (Hosen and Tabassum, 2021 (Sakib 2019, Sakib, Rabbani et al. 2022, Jabber, Sakib et al. 2023, Sahabuddin, Sakib et al. 2023)). Gender differences has a moderating effect since male and female consumers' decisions are influenced differentially by factors such as perceived healthiness, quarantine processes, perceived cleanliness, the simplicity of using the app, and attitude (Francioni, Curina et al., 2022). The study by Hosen and Tabassum highlights significant factors impacting customers' intention to continue using OFDS (online food delivery services).

2.5 Exploring Potential Challenges of Food Delivery Services

One of the primary challenges faced by food delivery services is related to labor and employment. The gig economy model employed by many delivery platforms often leads to issues concerning workers' rights, job security, and fair compensation

2.6 Conceptual Framework

(Belarmino et al., 2021). Delivery drivers, often classified as independent contractors, may lack access to benefits, social protections, and job stability, raising concerns about their well-being and livelihood (Ray et al., 2019). Logistical and operational complexities pose significant challenges to food delivery services. Ensuring timely and accurate deliveries while managing peak demand periods can be difficult, especially in densely populated urban areas (Kumar & Shah, 2021). These challenges are amplified during adverse weather conditions or unforeseen events, such as the COVID-19 pandemic, which disrupts supply chains and affects service quality (Zulauf et al., 2021). Delivering meals promptly while preserving their taste, temperature, and presentation can be intricate, as customer dissatisfaction due to food quality or service issues can lead to negative reviews and reputational damage (Hwang & Kim, 2019 (Sakib 2019, Sakib 2020, Sakib 2022, Sakib, Tabassum et al. 2023)). Issues such as food safety, hygiene standards, licensing, and taxes vary across regions and may impact the operations and compliance of food delivery platforms (Williams et al., 2020; Muller, 2018). Despite being the largest Bangladeshi-owned platform, it faces challenges in effectively leveraging its early entry advantage and local insights, lagging behind its global rival, Foodpanda (Ahmed 2017). Nguyen and Nguyen highlight the significance of maintaining food safety standards throughout the delivery process, from kitchen preparation to final delivery. Bangladesh Road Transport Authority (BRTA): They are in charge of regulating road transportation, which includes issuing licensees and keeping an eye on the delivery vehicles to make sure they follow safety and operation standards. Customs Regulations: Governing the export and import, with procedures for clearing customs, duties, and taxes applicable to international shipments (Uddin Ahmed and Ahmed 2018). Consumer Protection Act: Provides rules for protecting consumers' rights and safety during product delivery, including issues such as product quality, deception, and timely delivery. E-commerce Policies: Govern the operations of online marketplaces and their delivery services, including provisions for data privacy, dispute resolution, and customer complaints (Alam 2010). As restaurants got used to the new normal, they turned to delivery services as a way to stay in business during tough times (Ahuja, Chandra et al. 2021) with the support of legal parties.

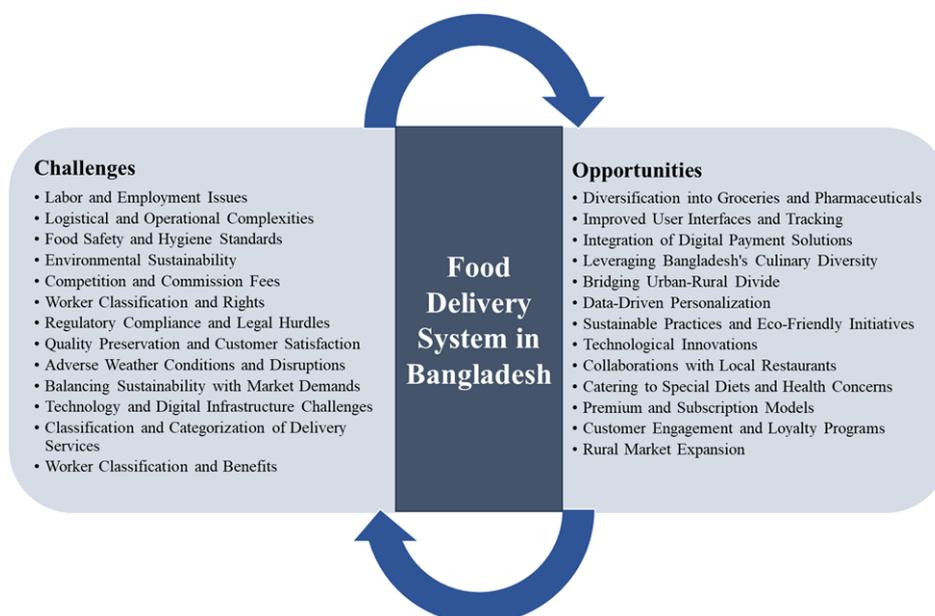


Figure 1: Conceptual Framework Source: Author

3. Research Methodology

In this explorative research, the researcher is following positivist philosophy where researcher is concluding his analysis based on scientific judgement. The study is based on deductive approach as the study is upon a small zone of overall food delivery service system. The research is based on mono method as only questionnaire has been used to get data from respondent by using survey strategy. The items of the questionnaire have been adapted based on this particular research that foundation is based on different previous study. In the questionnaire total 3 sections are available Section A: Demographics also Section B: Opportunities in the Food Delivery Services related to Food Application adaptability and Section C: Challenges in the Food Delivery Services related to Food. To measure different variable, different items has used here. To measure Improved tracking and user interfaces, 3 items have been used that is actually adapted for this particular study. To measure the different kinds also zone of food in Bangladesh, 2 items have been adapted. To measure personalization based on data, 2 items have been adapted also to measure innovations in technology, 3 items have been adapted. To measure Delivery Experience with Food Delivery Services, 3 items have been adapted. To measure Eco-Friendly Practices in Food Delivery Services, 2 items have been adapted. To measure Employment and legislation issue of Delivery Workers, 2 items have been adapted. To measure Food Quality and Presentation Issues, 3 items have been adapted. In this study, the researcher employs a cross-sectional research design, which captures data at a single point in time. To maintain integrity of questions or to ensure validity of items, two academicians, 1 manager from food delivery service has reviewed the questions that is attached in Appendices part.

A non-probability (convenience sampling) strategy has been used for the whole study as proper target population list or number is unknown also it will need too much time for data collection based on other strategy following so easier and convenient consideration of researcher has been taken in consideration that's why convenience sampling is used to collect data from the whole population. The population is almost unknown and the effect size f square is small so 0.15 is the effect size and the confidence level is 99% Also margin of error is 1% and the number of predictors is 7 so per G power software usage the sample or representative sample size is 164 but due to time limitation the data will be collected from 100 representatives only. The survey has been conducted by researcher convenient way that is exactly 100 participants, which has included consumers, delivery persons, and restaurant partners (Collis and Hussey, 2009). The Google form survey questionnaire has been designed to capture quantitative data from the sample for exploring their user preferences, satisfaction levels, encountered challenges, and attitudes towards technological integration and sustainability practices. SPSS data analysis specially reliability analysis, descriptive analysis, regression analysis, correlation has been done also based on that proper generalized analysis has been drawn upon over population. Ethical principles will be strictly upheld throughout the research process. Informed consent has been obtained from all participants, ensuring their voluntary participation. Privacy and confidentiality of participants' personal information has been maintained (Saunders et al., 2012). The study has adhered to ethical guidelines to ensure the well-being and rights of all involved parties.

4. Analysis and Findings

This section of the study has been designed to analyse the collected quantitative data collected from surveying the participants. Here the researcher has made the reliability analysis using Cronbach's Alpha, the descriptive statistical analysis using mean, standard deviation etc, and the inferential statistical analysis using correlation and regression analysis to bring the research outcomes.

Variables	Items	Cronbach's Alpha
Improved tracking and user interfaces	IT1	0.678
	IT2	
	IT3	
Using the different kinds also zone of food in Bangladesh	DZ1	0.447
	DZ2	
Personalization based on data	PBD1	0.534
	PBD2	
Innovations in technology	IY1	0.527
	IY2	
	IY3	
Delivery Experience with Food Delivery Services	DFS1	0.377
	DFS2	
	DFS3	
Eco-Friendly Practices in Food Delivery Services	EFP1	0.495
	EFP2	
Employment and legislation issue of Delivery Workers	ELW1	0.055
	ELW2	
Food Quality and Presentation Issues	FQI1	0.618
	FQI2	
	FQI3	

Figure 1: Reliability Test

Cronbach's alpha is a measure of how closely related a set of items are as a group. Higher values of Cronbach's alpha indicate better internal consistency. Improved tracking and user interfaces have a Cronbach's alpha of 0.678, which is reasonably good. Using different kinds of food in Bangladesh has a Cronbach's alpha of 0.447, which is relatively low and may suggest lower internal consistency. Personalization based on data has a Cronbach's alpha of 0.534, which is below the 0.7 threshold. Innovations in technology also have a Cronbach's alpha below 0.7. Delivery Experience with Food Delivery Services has a low Cronbach's alpha of 0.377. Eco-Friendly Practices in Food Delivery Services have a Cronbach's alpha of 0.495, which is below the recommended threshold. Employment and legislation issue of Delivery Workers have an extremely low Cronbach's alpha of 0.055. Food Quality and Presentation Issues have a Cronbach's alpha of 0.618, which is relatively good. Higher values are desirable as they indicate stronger internal consistency among the items within a variable. Variables with Cronbach's Alpha values below 0.7, may need further examination and refinement to improve reliability. Additionally, ELW stands out with an extremely low Cronbach's Alpha, suggesting serious concerns with its internal consistency. FQII, on the other hand, exhibits relatively good internal consistency. To enhance the reliability of measurements, consider revising items, collecting missing data, and ensuring that items effectively measure the intended constructs.

Descriptive Statistics			
	N	Mean	Std. Deviation
Improved tracking and user interfaces	100	3.7967	.77401
Using the different kinds also zone of food in Bangladesh	100	3.6950	.84655
Personalization based on data	100	3.9550	.86776
Innovations in technology	100	3.5800	.79366
Delivery Experience with Food Delivery Services	100	3.4467	.70944
Eco-Friendly Practices in Food Delivery Services	100	3.8500	.85723
Employment and legislation issue of Delivery Workers	100	3.1500	.83030
Food Quality and Presentation Issues	100	3.2967	.75789

Figure 2: Descriptive Statistics

Improved tracking and user interfaces: Mean: 3.7967: Std. Deviation: 0.77401: The variable "Improved tracking and user interfaces" has a mean score of approximately 3.80, indicating a moderate level of satisfaction or agreement among respondents. The standard deviation of 0.77 suggests that the responses vary moderately around this mean. **Using different kinds of food in Bangladesh:** Mean: 3.6950: Std. Deviation: 0.84655: The variable "Using different kinds of food in Bangladesh" has a mean score of approximately 3.70, indicating a moderate level of involvement or usage from different zone. The relatively high standard deviation of 0.85 suggests that there is moderate variability in the responses compared to some other variables. **Personalization based on data:** Mean: 3.9550: Std. Deviation: 0.86776: The variable "Personalization based on data" has a mean score of approximately 3.96, suggesting a relatively high level of agreement or satisfaction. The standard deviation of 0.87 indicates that there is moderate variability in the responses. **Innovations in technology:** Mean: 3.5800: Std. Deviation: 0.79366: The variable "Innovations in technology" has a mean score of approximately 3.58, indicating a moderate level of agreement or perception of technological innovations. The standard deviation of 0.79 suggests moderate variability in responses. **Delivery Experience with Food Delivery Services:** Mean: 3.4467: Std. Deviation: 0.70944: The variable "Delivery Experience with Food Delivery Services" has a mean score of approximately 3.45, suggesting a moderate level of satisfaction or experience. The standard deviation of 0.71 indicates moderate variability in responses. **Eco-Friendly Practices in Food Delivery Services:** Mean: 3.8500: Std. Deviation: 0.85723: The variable "Eco-Friendly Practices in Food Delivery Services" has a mean score of approximately 3.85, indicating a moderate level of approval or recognition of eco-friendly practices. The standard deviation of 0.86 suggests moderate variability in responses. **Employment and legislation issue of Delivery Workers:** Mean: 3.1500: Std. Deviation: 0.83030: The variable "Employment and legislation issue of Delivery Workers" has a mean score of approximately 3.15, suggesting a lower level of agreement or concern regarding employment and legislation issues. The standard deviation of 0.83 indicates moderate variability in responses. **Food Quality and Presentation Issues:** Mean: 3.2967: Std. Deviation: 0.75789: The variable "Food Quality and Presentation Issues" has a mean score of approximately 3.30, indicating a moderate level of satisfaction or concern related to food quality and presentation. The standard deviation of 0.76 suggests moderate variability in responses.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.523 ^a	.273	.218	.62728

Figure 3: R square

In this case, the R-squared value is approximately 0.273. It represents that approximately 27.3% of the variance in the dependent variable can be explained by the independent variable(s) in the model. This means that the independent variable(s) included in the model have a moderate explanatory power in predicting the variation in the dependent variable. It indicates a moderate level of goodness of fit.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.183	.445		2.660	.009
	Improved tracking and user interfaces	.032	.100	.035	.325	.746
	Using the different kinds also zone of food in Bangladesh	.015	.093	.018	.167	.868
	Personalization based on data	.041	.089	.050	.456	.650
	Innovations in technology	.057	.096	.064	.596	.552
	Eco-Friendly Practices in Food Delivery Services	.185	.084	.224	2.216	.029
	Employment and legislation issue of Delivery Workers	.250	.089	.292	2.814	.006
	Food Quality and Presentation Issues	.066	.091	.070	.720	.474

a. Dependent Variable: Delivery Experience with Food Delivery Services

Figure 4: Regression analysis

Improved tracking and user interfaces: Since the p-value (0.746) is greater than the typical significance level of 0.05, the null hypothesis for this variable can't be accepted as this is not statistically significant. Therefore, "Improved tracking and user interfaces" is not statistically significant in predicting "Delivery Experience with Food Delivery Services." **Using different kinds also zone of food in Bangladesh:** Similar to the previous variable, the p-value (0.868) is greater than 0.05 so can't be accepted, indicating that "Using different kinds also zone of food in Bangladesh" is not statistically significant in predicting "Delivery Experience with Food Delivery Services." **Personalization based on data:** The p-value (0.650) is greater than 0.05, suggesting that "Personalization based on data" is not statistically significant in predicting "Delivery Experience with Food Delivery Services" so can't be accepted." **Innovations in technology:** Once again, the p-value (0.552) exceeds the 0.05 threshold, indicating that "Innovations in technology" is not statistically significant in predicting "Delivery Experience with Food Delivery Services" so can't be accepted." **Eco-Friendly Practices in Food Delivery Services:** The p-value (0.029) is less than the 0.05 threshold so can be accepted. In this case, "Eco-Friendly Practices in Food Delivery Services" is statistically significant in predicting "Delivery Experience with Food Delivery Services." The null hypothesis is accepted. **Employment and legislation issue of Delivery Workers:** The p-value (0.006) is also less than 0.05, indicating that "Employment and legislation issue of Delivery Workers" is statistically significant in predicting "Delivery Experience with Food Delivery Services." The null hypothesis is accepted. **Food Quality and Presentation Issues:** The p-value (0.474) is greater than 0.05, suggesting that "Food Quality and Presentation Issues" is not statistically significant in predicting "Delivery Experience with Food Delivery Services." So the null hypothesis is not possible to be accepted. The variables "Eco-Friendly Practices in Food Delivery Services" and "Employment and legislation issue of Delivery Workers" are statistically significant in predicting "Delivery Experience with Food Delivery Services" as their p-values are less than 0.05. The remaining independent variables are not statistically significant in predicting the dependent variable "Delivery Experience with Food Delivery Services" as their p-values are greater than 0.05 so two hypothesis are accepted.

Correlation Analysis								
	IT	DZ	PBD	IY	DFS	EFP	ELW	FQI
IT	1	.480**	.437**	.384**	.232*	.304**	.202*	.207*
DZ	.480**	1	.397**	.421**	.266**	.256*	.371**	.247*
PBD	.437**	.397**	1	.376**	.304**	.398**	.339**	.266**
IY	.384**	.421**	.376**	1	.309**	.354**	.360**	.284**
DFS	.232*	.266**	.304**	.309**	1	.369**	.431**	.240*
EFP	.304**	.256*	.398**	.354**	.369**	1	.270**	0.111
ELW	.202*	.371**	.339**	.360**	.431**	.270**	1	.346**
FQI	.207*	.247*	.266**	.284**	.240*	0.111	.346**	1

Figure 5: Correlation

IT (Improved tracking and user interfaces) has positive correlations with DZ (Using different kinds of food in Bangladesh), PBD (Personalization based on data), IY (Innovations in technology), DFS (Delivery Experience with Food Delivery Services), ELW (Employment and legislation issue of Delivery Workers), and FQI (Food Quality and Presentation Issues). The strength of these correlations varies, with the highest being 0.480 with DZ. **DZ (Using different kinds of food in Bangladesh)** has

positive correlations with IT, PBD, IY, DFS, and ELW, with the highest correlation being 0.480 with IT. **PBD (Personalization based on data)** shows positive correlations with IT, DZ, IY, DFS, and ELW, with the highest correlation being 0.437 with IT. **IY (Innovations in technology)** has positive correlations with IT, DZ, PBD, DFS, and ELW, with the highest correlation being 0.421 with DZ. **DFS (Delivery Experience with Food Delivery Services)** has positive correlations with IT, DZ, PBD, IY, EFP (Eco-Friendly

Practices in Food Delivery Services), and ELW, with the highest correlation being 0.431 with ELW. **EFP (Eco-Friendly Practices in Food Delivery Services)** has positive correlations with IT, PBD, IY, DFS, ELW, and a weaker correlation with FQI (Food Quality and Presentation Issues). **ELW (Employment and legislation issue of Delivery Workers)** shows positive correlations with IT, DZ, PBD, IY, DFS, EFP, and FQI, with the highest correlation being 0.431 with DFS. **FQI (Food Quality and Presentation Issues)** has positive correlations with ELW and a weaker correlation with IT and DZ. Overall, these correlation coefficients provide insights into the relationships between variables. Variables with higher positive correlations tend to move in the same direction, while those with negative correlations move in opposite directions. It's important to note that correlation does not imply causation, and the strength of these relationships may vary in practical contexts. These correlations can guide further analysis and exploration of the relationships between these variables.

5. Findings and Discussion

The findings of the research indicate that several factors have varying degrees of influence on the delivery experience with food delivery services. Among the variables studied, "Eco-Friendly Practices in Food Delivery Services" and "Employment and legislation issue of Delivery Workers" were found to be statistically significant predictors of delivery experience (Hosen and Tabassum, 2021). This suggests that consumers and stakeholders in the food delivery industry place importance on eco-friendly practices and employment-related issues when evaluating their delivery experiences. On the other hand, variables such as "Improved tracking and user interfaces," "Using different kinds of food in Bangladesh," "Personalization based on data," "Innovations in technology," and "Food Quality and Presentation Issues" did not show significant predictive power for delivery experience (Hwang & Kim, 2019). These findings suggest that while these factors may play a role in the overall food delivery service ecosystem, they may not be as critical in shaping the specific experience of receiving a food delivery. Overall, these findings provide insights into the factors that impact the delivery experience in the context of food delivery services, highlighting the importance of eco-friendly practices and employment-related concerns in shaping consumer perceptions and satisfaction. Further research and refinement of measurement tools may be needed to explore these factors more comprehensively.

6. Theoretical and Managerial Implication

The research offers significant theoretical and managerial implications for the food delivery industry in Bangladesh. The study delves into the challenges related to labor and employment in the gig economy, highlighting the issues faced by delivery workers. By addressing the environmental concerns associated with food delivery, the research adds to the theoretical understanding of sustainability practices in the context of the food industry. It explores the role of food delivery platforms in promoting eco-friendly packaging and responsible sourcing. From a managerial perspective, this research carries several key implications (Muller, 2018; Smith, Johnson, and Lee, 2018). Factors such as quick delivery times, real-time tracking, and user-friendly interfaces can be prioritized to enhance the overall customer experience. Additionally, the importance of addressing labor-related challenges in the gig economy, suggesting that companies can focus on workers' rights, fair compensation, and job security to improve the

well-being of delivery personnel and bolster their public image (Belarmino et al., 2021). Understanding and navigating regulatory challenges in the industry is crucial for long-term sustainability, making collaboration with regulatory authorities to ensure compliance with safety, hygiene, licensing, and tax regulations a strategic imperative. Embracing eco-friendly practices and sustainability initiatives, including sustainable packaging and responsible ingredient sourcing, can position food delivery services as environmentally conscious options in the market. Throughout this study, it can empower food delivery businesses, policymakers, and stakeholders to enhance their operations, increase customer satisfaction, and adopt sustainable practices within the distinctive context of Bangladesh's food delivery market. These insights have the potential to drive positive changes, fostering growth and economic impact while ensuring the well-being of both customers and workers in the industry.

7. Conclusion

The food delivery services market in Bangladesh has witnessed rapid expansion, driven by the convenience and accessibility offered by digital platforms. This research has illuminated crucial aspects of the food delivery services market in Bangladesh, with a specific focus on food applications. The integration of digital payment solutions aligns with the transition towards a cashless economy, further emphasized by the COVID-19 pandemic. However, this growth is accompanied by challenges, including concerns about workers' rights and fair compensation in the gig economy model, logistical complexities, food safety standards, and environmental sustainability (Williams et al., 2020; Chen and Wu, 2021). To ensure the industry's continued success, it is crucial to address these challenges while capitalizing on opportunities like diversification into groceries, digital payment integration, and leveraging the country's diverse culinary offerings. A well-defined regulatory framework and a focus on enhancing the customer experience are also vital for the industry's sustainable and prosperous future (Hosen and Tabassum, 2021; Muller, 2018). The study identified "Eco-Friendly Practices in Food Delivery Services" and "Employment and Legislation Issues of Delivery Workers" as statistically significant factors influencing the delivery experience, underlining the importance of sustainability and workers' rights within this industry. While other factors like technological innovations, food variety, personalization, and food quality are undoubtedly relevant to the broader food delivery ecosystem, they were found to have less impact on the specific delivery experience in Bangladesh (Frederick and Bhat 2021; Nasir, Rahman et al. 2022). This research carries theoretical implications by deepening our understanding of sustainability and labor challenges in the gig economy and managerial implications by emphasizing the need for eco-friendly packaging, addressing employment concerns, and navigating regulatory complexities. Ultimately, these insights can guide stakeholders in fostering a more sustainable, customer-centric, and prosperous food delivery services sector, benefiting both the industry and the economy of Bangladesh.

8. Limitation and Future Studies

The following study has been designed using a survey questionnaire to collect the data and make the analysis and generate the outcomes. The study could have conducted a semi-structured interview or focus group discussion with the experts to bring more potential outcomes. A longitudinal study can also be

done where the data of each of the food delivery applications will be observed for a long time to generate more appropriate outcomes. The future studies can also include the study on the food delivery riders, their approaches, opportunities and problem they are facing. Also, the study can be conducted on how the restaurant businesses are becoming digitalized through the use of food delivery system in Bangladesh.

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Appendix

Opportunities for Food Delivery Services

Opportunity Name	Citation
Diversification into Groceries and Pharmaceuticals	Hosen and Tabassum, 2022
Improved User Interfaces and Tracking	Pillai, Kim et al., 2022
Integration of Digital Payment Solutions	Islam, Arif et al., 2022
Leveraging Bangladesh's Culinary Diversity	Nasir, Rahman et al., 2022
Bridging Urban-Rural Divide	Ramos, 2022
Data-Driven Personalization	Hosen and Tabassum, 2021; Gupta and Singh, 2017
Sustainable Practices and Eco-Friendly Initiatives	Hosen and Tabassum, 2021; Muller, 2018
Technological Innovations	Lee and Park, 2016; Hosen and Tabassum, 2021
Collaborations with Local Restaurants	Pillai, Kim et al., 2022

Opportunity Name	Citation
Catering to Special Diets and Health Concerns	Hosen and Tabassum, 2021; Ray et al., 2019
Premium and Subscription Models	Islam, Arif et al., 2022
Customer Engagement and Loyalty Programs	Hosen and Tabassum, 2021; Kumar and Shah, 2021
Rural Market Expansion	Ramos, 2022; Hosen and Tabassum, 2022
Cross-Promotions and Bundled Offerings	Pillai, Kim et al., 2022
Personalized Marketing and Recommendations	Hosen and Tabassum, 2021; Gupta and Singh, 2017
Contactless and Cashless Transactions	Islam, Arif et al., 2022
Social Media and Influencer Partnerships	Pillai, Kim et al., 2022
Health and Safety Assurance	Hosen and Tabassum, 2021; Ray et al., 2019
Dynamic Pricing Strategies	Pillai, Kim et al., 2022
Sustainable and Ethical Sourcing	Hosen and Tabassum, 2021
Integration of Emerging Technologies	Islam, Arif et al., 2022

Challenges for Food Delivery Services

Challenge Name	Citation
Labor and Employment Issues	Belarmino et al., 2021
Logistical and Operational Complexities	Kumar & Shah, 2021
Food Safety and Hygiene Standards	Williams et al., 2020
Environmental Sustainability	Muller, 2018
Competition and Commission Fees	Bhotvawala, Balihallimath et al., 2016
Worker Classification and Rights	Ray et al., 2019
Regulatory Compliance and Legal Hurdles	Azmat and Coghill, 2005
Quality Preservation and Customer Satisfaction	Hwang and Kim, 2019
Adverse Weather Conditions and Disruptions	Zulauf et al., 2021
Balancing Sustainability with Market Demands	Chen and Wu, 2021
Technology and Digital Infrastructure Challenges	Alam, 2010
Classification and Categorization of Delivery Services	Lee and Park, 2016
Worker Classification and Benefits	Al Amin, Arefin et al., 2021