

Report On  
Unveiling Post-COVID-19 Dynamics: A Comprehensive Analysis  
of Customer Satisfaction and App Usage at Prime Bank's Jatrabari  
Branch

By

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An internship report submitted to the BRAC BUSINESS SCHOOL in partial fulfillment  
of the requirements for the degree of  
Bachelor of Business Administration.

Bachelor of Business Administration

BRAC University

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## Declaration

It is hereby declared that

1. The internship report submitted is my/our original work while completing a degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material that has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

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## Letter of Transmittal

Shihab Kabir Shuvo

Senior Lecturer,

BRAC Business School

BRAC University

66 Mohakhali, Dhaka-1212

Subject: Internship Report Submission

Dear Sir,

This is my pleasure to display my entry-level position and provide details regarding 'General banking & Customer Service of Prime Bank Ltd', for which I was appointed by your direction.

I have attempted my best to finish the report with the essential data and recommended proposition in a significant compact and comprehensive manner as possible.

I trust that the report will meet the desires.

Sincerely yours,

---

Abdus Samiul Basir

Student ID: 17104023

BRAC Business School

BRAC University

Date: September, 2023

## Non-Disclosure Agreement

This agreement is made and entered into by and between Prime Bank and the undersigned student at Brac University Abdus Samiul Basir. This paper on “Unveiling Post-COVID-19 Dynamics: A Comprehensive Analysis of Customer Satisfaction and App Usage at Prime Bank's Jatrabari” will not be distributed anywhere other than my report work and presentation.

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Title of Report: Unveiling Post-COVID-19 Dynamics: “A Comprehensive Analysis of Customer Satisfaction and App Usage at Prime Bank's Jatrabari”

Abdus Samiul Basir

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BRAC Business School BRAC University

## Acknowledgment

First, I would like to thank Prime Bank for allowing me to be at their office for 3 months. My supervisor Shuvo sir helped me a lot to build this report. I want to thank sir more for letting me keep my creative freedom for this report.

A huge thanks goes to my supervisor from Prime Bank Muntaha Apu for helping me along the way. And to all the members of the bank who showed me that I was fearful for no reason especially Tuhin vaiya, Tanvir vaiya, Shulekha apu, and Rahoman vaiya. They taught me a lot in a very short period. I cannot express my gratitude towards them in words so I am keeping it short.

One of the greatest leaders I have ever seen in my life is Kamrul sir, our Jatrabari branch manager. On the other hand, Awlad sir, our operation manager has one of the distinct skills of managing people and working efficiently. Lastly, Arshad sir, our credit in charge is one of the most knowledgeable people I have ever seen in the banking industry. However, the main distinguishing factor is their humble behavior despite of their achievements. I want to thank them for all their help, hoping one day I will be able to be someone like them.

## Executive Summary

In this study, we conducted a series of tests to explore how the COVID-19 strike in Bangladesh in 2020 affected customer satisfaction and app usage among 19 customers at Prime Banks Jatrabari branch. We set the significance level ( $\alpha$ ) at 0.05.

Regarding customer satisfaction with the app, we found that there was an increase in satisfaction scores after the strike ( $M = 39.89$   $SD = \pm 3.755$ ) compared to before the strike ( $M = 30.16$   $SD = \pm 4.086$ ). On average customer satisfaction increased by 9.737 units with a confidence interval of [11.630 7.844] at a confidence level of 95%. The results of the paired sample t-test showed a significant difference ( $t(19) = 10.806$ ,  $p < 0.001$  two-tailed) indicating that the COVID-19 strike had a considerable impact on customer app satisfaction.

Likewise, when it came to app usage, we noticed that there was an increase in weekly usage after the strike ( $M = 5.65$   $SD = 2.813$ ) compared to, before the strike ( $M = 3.53$   $SD = 2.144$ ). On average weekly usage increased by 2.105 units within a confidence interval of [ 3.751 0.460] at a confidence level of 95%. According to the results of the paired sample t-test, there was a difference ( $t(19) = 2.688$   $p = 0.015$ , two-tailed) indicating that app usage was affected.

These findings imply that the COVID-19 outbreak had an impact on both customer satisfaction with the app and how frequently it was used at Prime Banks Jatrabari branch. More research is needed to understand the factors behind these changes and to develop strategies, for improving customer experience and engagement in a pandemic world.

**Keywords:** Customer app satisfaction, App usage, COVID-19 impact, Prime Bank Jatrabari branch, Banking industry, Customer behavior

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## List of Acronyms

ROE	Return on Equity
ROA	Return on Asset
NPL	None Performing Loan
CS	Customer Satisfaction
STD	Standard Deviation
TIN	Taxpayer Identification Number
CTR	Cash Transaction Report
STR	Suspicious Transaction Report
NID	National Identity Card
MAE	Mean Absolute Error
RMSE	Root Mean Squared Error
CA	Current Account
SA	Savings Account
SOD	Secure Overdraft
EPS	Earnings Per Share
KDE	Kernel Density Estimation

# 1. Chapter 1 - Overview of Internship

## 1. 1. Student information

Name: Abdus Samiul Basir

Id: 17104023

Program: BBA

Major: Computer Information Management

Minor: Finance

## 1. 2. Internship information

- Period: 3 months
- Company name: Prime Bank Ltd
- Department: General Banking
- Address: Level 1, House- 1A, Road- 16/A, Gulshan-1, Dhaka-1212 Bangladesh.
- Internship Company Supervisor's Information:
  - Name: Sidratul Muntaha
  - Position: Officer

## 1. 3. Internship Outcome

### 1. 3. 1. Student's contribution:

- Helping the cash in charge to build CTR reports each month.
- Building STR report with the help of Cash in charge.

- Providing Customer service like helping them to fill up the forms, deposit slips, RTGS, checking balance, etc.
- Verifying NID form and TIN.
- Delivering checks to the customers.
- Delivering cards to the customers.
- Helping the operation manager to identify the unused assets and find a convenient vendor to sell those assets.
- Helping the officers to find customers for CA/SA accounts.
- Presentation slides and reports regarding the promotional plan.
- Meeting minutes management.
- Helping the company supervisor to create documentation for SOD etc.

#### 1.4. Benefits To the Student:

The internship helped me to develop some important general skills like punctuality. I learned how to apply theoretical skills that I learned from my university study in the real world. Furthermore, the internship helped me to learn some important practical skills which can be useful further in my career. My company supervisor was a remarkable woman, she helped me to be comfortable with the team and learn along the way. Now, let's talk about some major skills that I developed during the internship:

- **Communication skill:** The main portion of my time was spent in the Customer service area. I developed profound communication skills by talking to the customers on a daily basis. The customers of Prime Bank Jatrabari have divorced backgrounds, as a result, I needed to adapt my language to help them understand my words as smoothly as possible.

- **General banking process:** Throughout my days as an intern, I learned how a bank process. As I learned how general banking works my day-to-day banking life has become much smoother.
- **Ability to Work under pressure:** Some of the days spatially during the Eid season the workload increased exponentially. At that time most of the officers did not even get enough to have lunch properly. During that time, I had to adapt to the environment and learn how to work under pressure.

## 2. Chapter 2 - Overview of Organization

### 2.1. Introduction

Prime Bank, established in 1995 is a commercial bank, in Bangladesh that belongs to the second generation of banks. Operating from its headquarters situated in Dhakas district called Motijheel the bank boasts an extensive network of 146 branches and 170 ATM locations throughout the country. Its establishment was made possible by the implementation of the Companies Act in 1994.

One notable aspect of Prime Bank is its expertise in Corporate and Institutional Banking, where it specializes in tailoring solutions to meet the requirements of its clients. In addition to banking services the bank also embraces innovation by providing users with online banking options that offer a modernized financial experience.



The exceptional achievements of Prime Bank have garnered recognition. Global Finance, a newspaper awarded Prime Bank as the Best Bank in Bangladesh for its outstanding performance in 2020. Similarly, Asiamoney recognized Prime Bank as the Best Digital Bank during that year for its technological prowess.

In pursuit of enhanced efficiency and standardized banking practices, Prime Bank embarked on an initiative called 'Business Model Restructuring and Centralization' back in 2014. This project aimed to streamline business operations and improve efficiency.

To summarize Prime Bank's trajectory exemplifies its commitment to innovation, customer-centric services, and operational excellence. As a player, within Bangladesh's landscape, their competence and adaptability have played crucial roles in their long-standing success.

## 2. 2. Mission, Vision, and Objectives:

### 2. 2. 1. Mission:

“To be the best Private Commercial Bank in Bangladesh in terms of efficiency, capital adequacy, asset quality, sound management and profitability having strong liquidity.”

### 2. 2. 2. Vision:

“To build Prime Bank Limited into an efficient, market-driven, customer-focused institution with a good corporate governance structure.

Continuous improvement of our business policies, procedure, and efficiency through integration of technology at all levels.”

### 2. 2. 3. Objectives:

#### **- For Our Customers:**

To make sure our customers get the best service that the company can provide we try to come up with innovative ideas to help the banking process.

#### **- For Our Employees:**

To keep our employees happy, the company tries to provide good facilities and career growth direction as happy employees lead to happy customers.

**- For Our Shareholders:** To keep our Shareholders happy, the company tries to keep the business profitable so that they can get what they deserve.

**- For Our Community:** The company wishes to be a good company that cares about the people in its surroundings. The company observes our country's rules and attempts to help our country progress. Furthermore, the company believes in being truthful and doing things correctly.

## 2.3. Corporate Organism:

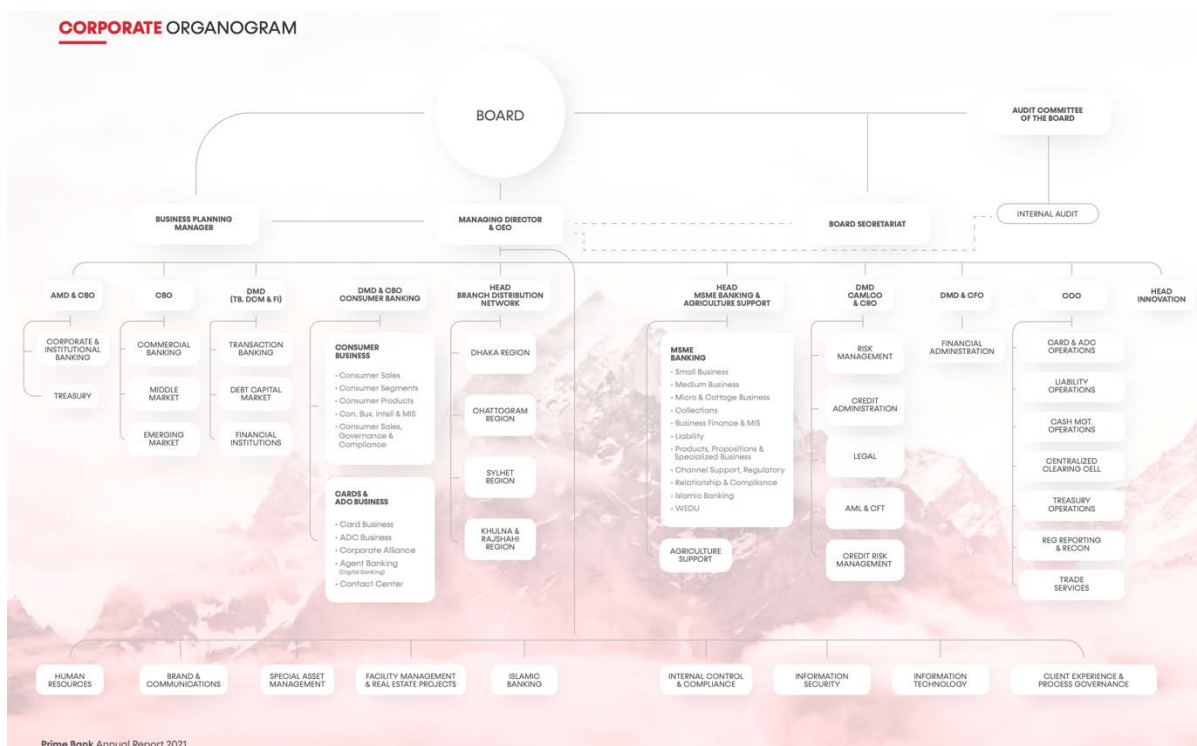


Figure 1: Prime bank Organogram

## 2.4. Key Matrices of Prime Bank:

In this portion of the report, we will look into some important financial matrices. All the information was collected from secondary data sources like Prime Bank's financial statement.

### 2.4.1. Deposits:

Deposits are the funds that customers place into the bank through various accounts like savings and current accounts. The more deposits a commercial bank has the more the bank can lend more loans to the individuals. The interest from the loan is the primary income source for a commercial bank. A bank with a large deposit increases customer and investor confidence as the bank now has more lending-capability and more liquidity at its disposal. In the table below are the deposits of Prime Bank over 5 years.

Table 1: Deposits table

Year	2022	2021	2020	2019	2018
Deposits BDT (in Million)	265,841	243,070	233,028	216,444	197,518

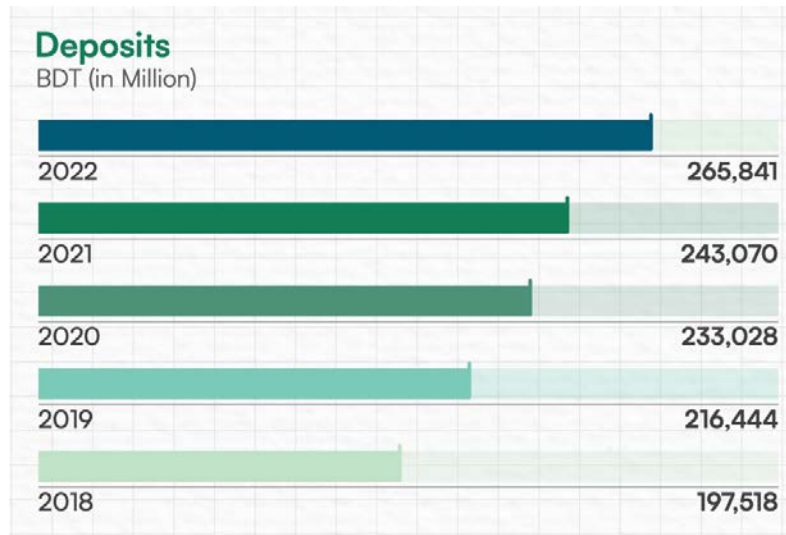


Figure 2: Deposits chart

As we can see the deposits of Prime Bank have increased over the year. Currently, it is at 265,841 which is approximately a 9.36% increase compared to the previous year and almost a 34.59% increase compared to 2018. Meaning as a result of this customers can be more confident in the company and the bank has more money to lend as a result.

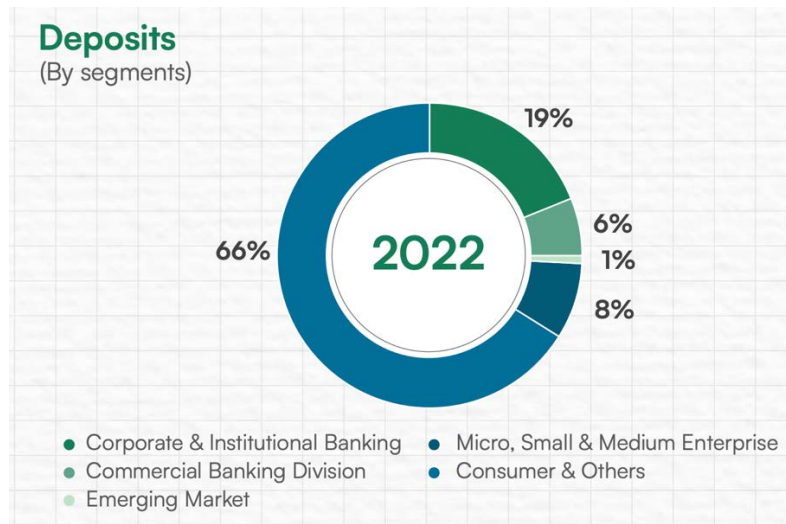


Figure 3: Deposits by segments

The portfolio of the deposits of 2022 mainly consists of consumer deposits which are almost 66% of the total deposits, and there are almost 19% corporate & institutional banking, coming up next micro, small & medium businesses containing 8% of the total deposits. Furthermore, there are 6% of commercial banking division deposits and 1% of emerging markets.

#### 2. 4. 2. Loan and Advances:

Loan and Advances is the Primary source of profit for a commercial bank. With more loans, a bank provides more it can earn with interest. Therefore, increasing loans is one of the key objectives for a bank. In the table below are the loans and advances of Prime Bank over 5 5-year period.

Table 2: Loan and advances table

Year	2022	2021	2020	2019	2018
Loan & Advances BDT (in Million)	296,481	263,015	232,400	213,955	205,810

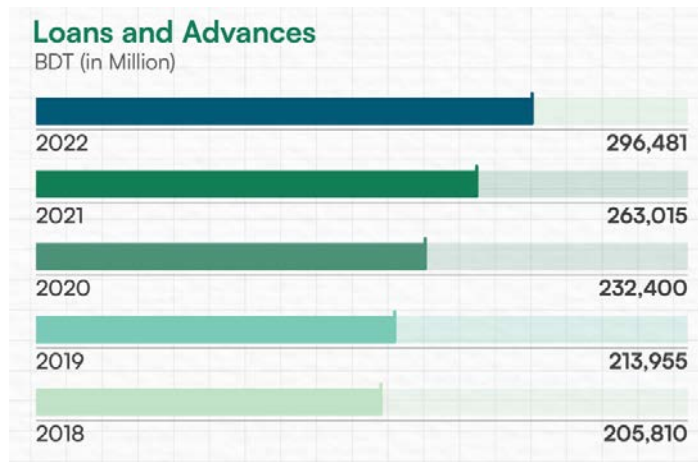


Figure 4: Loans and Advances

As can see the amount of loans has increased for Prime Bank over the year. This means the bank has more opportunities to earn profit due to that.

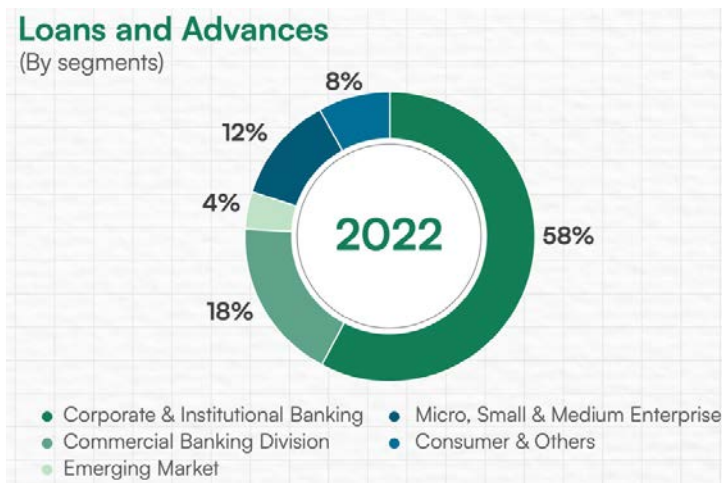
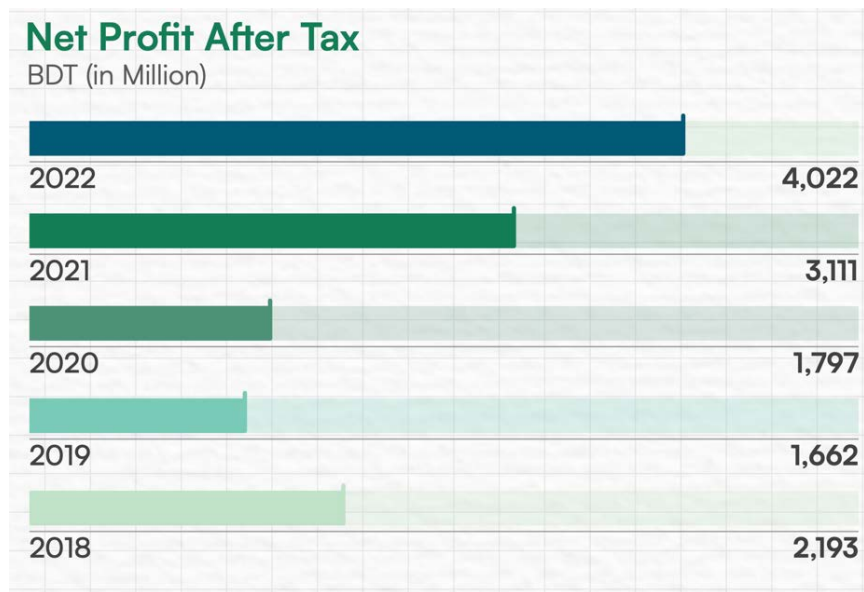


Figure 5: Loans and advances by segments

The portfolio of the Loan of 2022 mainly consists of corporate & institutional banking which is almost 66% of the total loan, and there are almost 18% commercial banking divisions, Micro, small & medium businesses contain 12% of the total loan. Furthermore, there are 8% of consumer loans and 4% of emerging markets.

### 2. 4. 3. Net Profit After Tax:



*Figure 6: Net profit after tax chart*

From the chart above we can see that the net profit after tax in 2022 was almost 4,022 million which is 29.27% more than the previous year. Furthermore, it's been rising for the last four years consecutively after getting down in 2019. Now it's almost double compared to 2018.

#### 2. 4. 4. NPL:

A non-performing loan, or NPL, encapsulates a financial predicament where a borrower's failure to meet loan repayment commitments extends over a prolonged period. This leads to an arrear situation, where the borrower is in default.

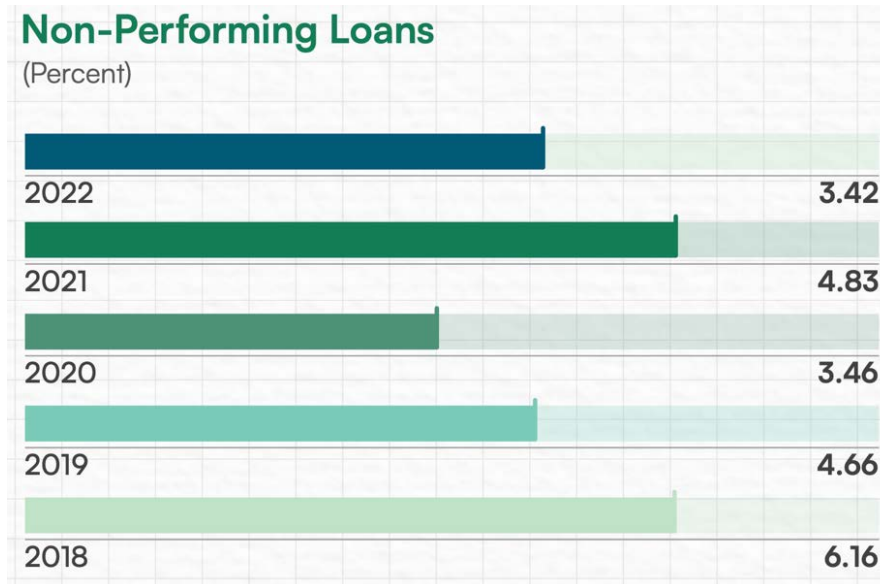


Figure 7: NPL chart

From the chart above we can see that at its lowest in the last 5 years. The non-performing loan (NPL) metric has reached its lowest over the past half-decade. This signifies a remarkable downtrend in the proportion of loans that are delinquent or in default. Such a decline hints at an enhanced credit environment and heightened borrower solvency. This shift could be attributed to stronger economic conditions, improved borrower financial health, and effective credit risk management strategies taken by financial institutions. The declining NPL trend is good for lenders, as it indicates a reduced level of financial vulnerability and potential losses due to loan defaults. Moreover, this downward trajectory indicates the stability of the banking sector, as lower NPL ratios correlate with a healthier loan portfolio and overall fiscal robustness.



### 2. 4. 5. Cost of Deposits:

The cost of deposit expresses a financial metric that is the expense borne by financial institutions in securing funds from depositors. This includes many factors. Like interest payments, administrative costs, and operational overheads.

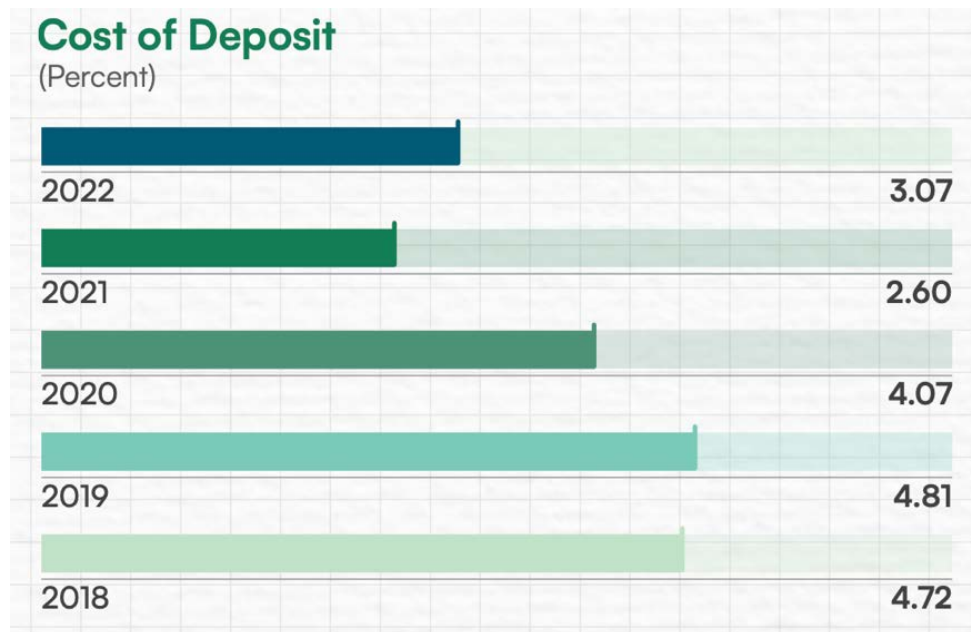


Figure 8: Cost of deposit chart

The cost of funds has undergone a multifaceted trajectory: it is lower compared to the three years before the previous year, yet registers a higher status in contrast to the preceding year. This temporal swing suggests a dynamic interplay of financial dynamics. The lower cost about three years ago indicates a favorable trend of reduced expenditure in sourcing funds, which can be attributed to factors like wise financial management and market conditions. However, the upswing in the prior year signifies an increased expanse in acquiring funds, potentially a reflection of different economic conditions or shifts in operational strategies.

#### 2. 4. 6. ROA:

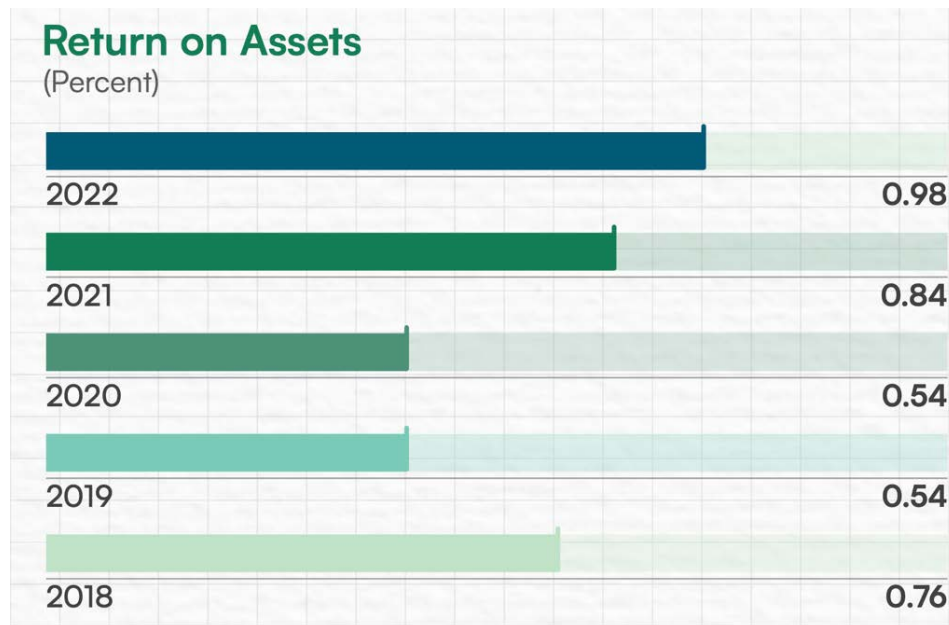


Figure 9: ROA chart

The ROA was 0.76 in 2018, then it went down a little in 2019. After 2019 it stayed the same in 2020. However, the year after in 2021 it had a huge jump of around 55.56%. And now it's at 0.98.

This high ROA in recent years indicates that the bank can better utilize its assets to generate earnings compared to previous years. Furthermore, it indicates that now the bank is more efficient in utilizing its resources.

#### 2. 4. 7. ROE:

ROE indicates how efficiently the company is using its shareholder's money to generate earnings. Higher ROE signifies that the company is cost-effective having a strong profit.

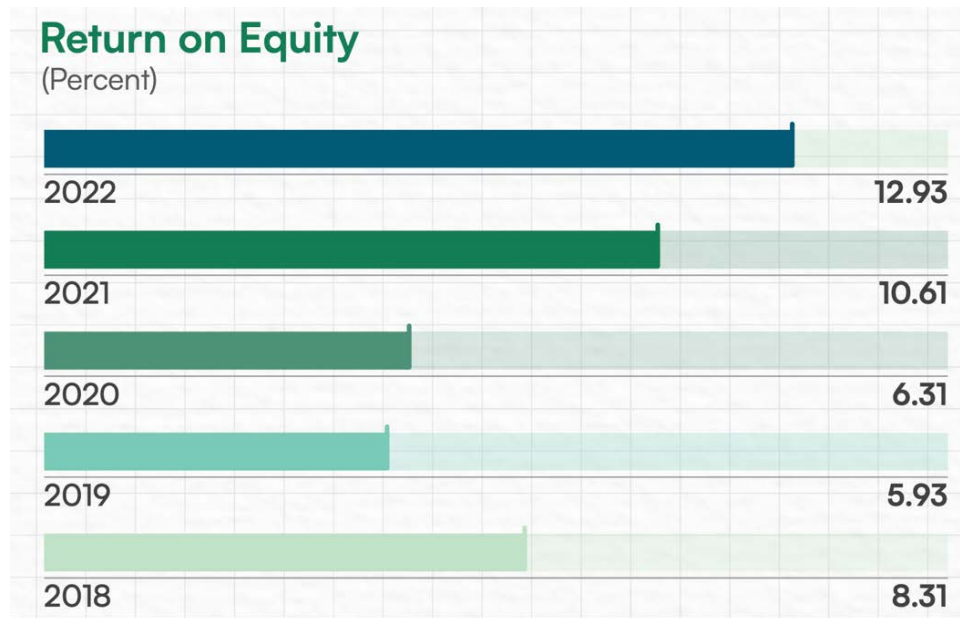


Figure 10: ROE chart

The ROE of prime banks has been increasing in recent years. After the fall in 2019, where it went from 8.31 to 5.83 is finally recovering from it. The ROE is consistently increasing each year and finally reaching 12.93 in 2022 which is around a 55.56% increase compared to 2018 before the falling year.

#### 2. 4. 8. EPS:

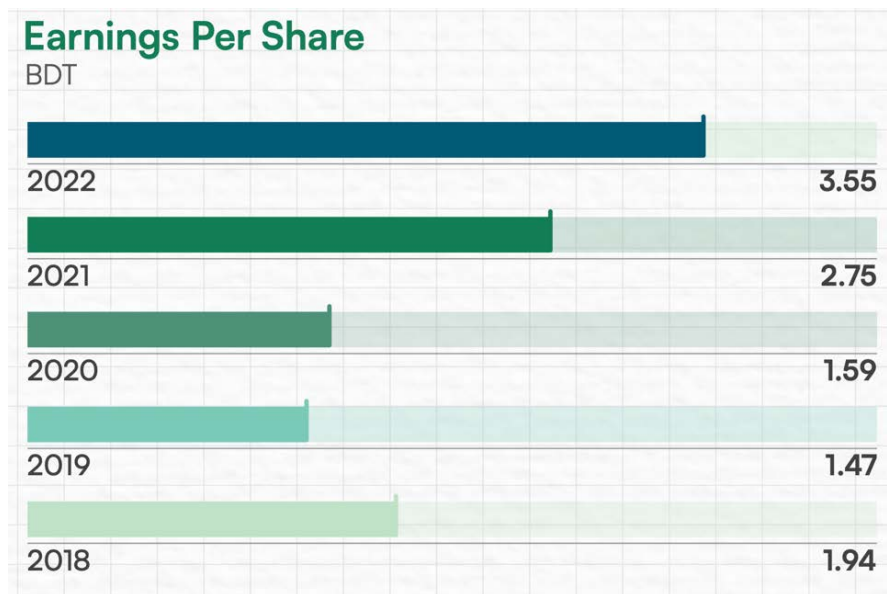
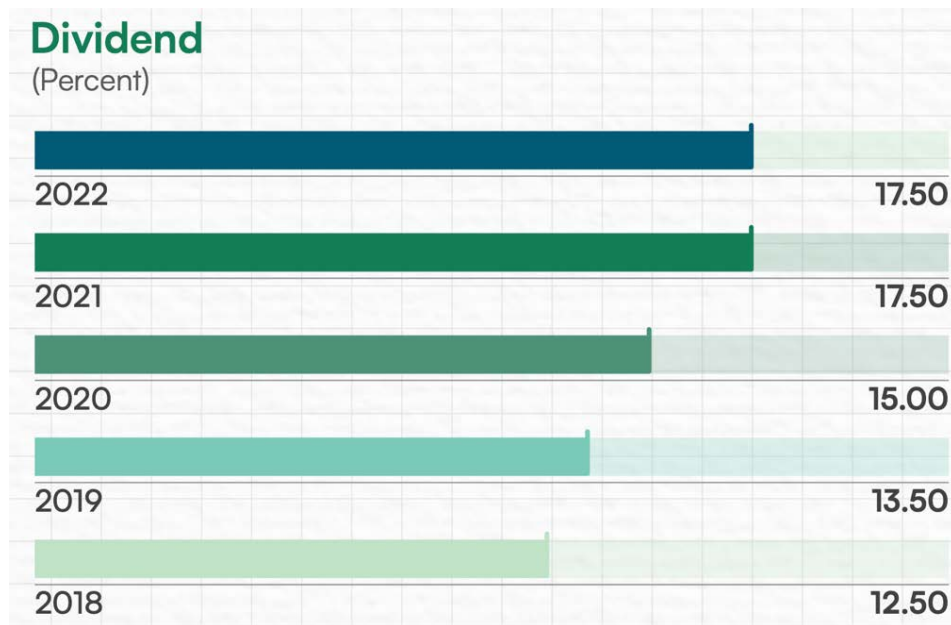


Figure 11: EPS chart

From the chart above we can see that the bank has a consistent increase in its EPS after the year 2018. Spatially, in the last two years, the EPS is been very good which means the common shareholders are getting more money from their stock. This year it has increased approximately 29.09% compared to last year.

#### 2. 4. 9. Dividend:



*Figure 12: Dividend chart*

The dividend has shown a fluctuating trajectory across the past few years. In 2022 and 2021, the dividends stood at 17.5, while in 2020, they were at 15. This marked an increase from 2019 when dividends were at 13.5 and 2018 with dividends at 12.5. These patterns tell us about a slight consistent increase in shareholder returns, indicating good corporate performance, market conditions, and financial strategies. Furthermore, the upward slope indicates that the bank is performing well in its financial condition, which allows it to provide higher dividends to its shareholders. However, the prior fluctuations reflect the ever-evolving landscape, and strategic planning to ensure consistent value creation for shareholders.

## 2.5. SWOT Analysis of Prime Bank:

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>○ High-quality service.</li> <li>○ Huge capital funds.</li> <li>○ Highly educated professional managers.</li> <li>○ Wide converge with almost 146 branches all over the country.</li> <li>○ Fast foreign exchange delivery.</li> <li>○ Proficient online banking system that has a great user experience.</li> <li>○ Around 170 ATM facilities across the country.</li> </ul>	<p style="text-align: center;"><b>Weakness</b></p> <ul style="list-style-type: none"> <li>○ Unavailability of self-owned ATM booth.</li> <li>○ No support of recovery agents.</li> </ul>
<p style="text-align: center;"><b>Opportunity</b></p> <ul style="list-style-type: none"> <li>○ Chance of having government support.</li> <li>○ Improve the service efficiency.</li> <li>○ Properly expand as a global bank.</li> <li>○ Improve their E-Banking and information technology to a greater extent.</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>○ Unstable politics of Bangladesh can affect the banking process.</li> <li>○ High competition almost 61 banks are operating currently in Bangladesh.</li> <li>○ Unstable global economy due to covid-19 and conflicts around the world.</li> </ul>

### 2.5.1. Strengths:

Prime Bank delivers top-notch services to its customers. Specifically, from my experience customer service team even fills up the account forms of the customers. The Bank also possesses a high amount of capital resources that allows it to be well-equipped to meet various financial needs. The bank has highly educated professionals and managers which allows them to be innovative and provide greater service. Around 146 branches are scattered throughout the nation, providing extensive coverage and accessibility to a wide range of customers. The

Bank's Digital banking is top-notch us great usability and interesting functionality. Furthermore, it almost has 170 ATMs positioned throughout the nation, helping it to maintain service quality.

#### **2. 5. 2. Weakness:**

The organization is facing a handful of serious problems. For starters, it lacks self-owned ATM booths, which may influence the convenience of its consumers in getting cash and executing transactions. Furthermore, the lack of recovery agents complicates the process of recovering late debts or payments. These factors indicate areas where the company could improve its services and operational efficiency to better meet the needs of its customers and improve overall financial processes.

#### **2. 5. 3. Opportunity:**

The bank has some opportunities they can consider. Firstly, they can try to gain government assistance, which will allow them to improve their operations. By investing in their RND and E-Banking they can improve the efficiency of the service process and distinguish themselves from the competitors. Lastly, the Bank can try to increase its global presence although it might require a lot of preparation.

#### **2. 5. 4. Threats:**

The unstable politics of Bangladesh can affect the banking process which can bring devastating consequences. An unstable global economy due to covid-19 and conflicts around the world like the Russia and Ukraine wars, can harm the supply decrease the currency value, and increase our already high inflation. Lastly, due to high competition in Bangladesh which contains almost 61 banks are operating currently, makes it difficult to do business and sustain a competitive advantage.

## 3. Chapter 3 -

### 3. 1. Literature review:

#### 3. 1. 1. Introduction to Mobile Banking in Bangladesh:

Banking applications have become a part of the financial landscape in Bangladesh offering convenience, accessibility, and a wide range of services to users. However, the COVID-19 pandemic has had an impact on various industries, including banking. One area that has been particularly affected is the level of satisfaction and usage of banking apps in Bangladesh.

According to a study conducted by Khatun et al. (source 1) (Chmielarz, W., 2021) there has been an increase in registered mobile banking customers in Bangladesh due to the emergence of the COVID-19 pandemic. This study highlighted that government policies aimed at facilitating mobile banking transactions and digital financial access during this time have contributed to the rise in usage and satisfaction levels (Chmielarz, W., 2021). Additionally, several other studies have examined how COVID-19 has impacted banking app satisfaction and usage in Bangladesh. These studies have focused on factors such as individual's willingness to use branchless banking during the pandemic customer experiences with internet banking, satisfaction levels, trustworthiness, loyalty, and e-service quality (source 2) (Harun A., M., 2022).

The impacts of COVID-19 on banking app usage and satisfaction levels, in Bangladesh have yielded results. According to studies, it appears that people have become more satisfied, and are using online financial transactions more frequently during lockdowns (Chmielarz, W.,



2021). This can be attributed to the convenience and sense of security it offers when conducting transactions from the comfort of their homes.

On the side, several studies suggest that satisfaction and usage have declined due, to challenges arising from limited internet access, low technological literacy, and concerns regarding privacy and information security in the era of COVID-19 ([Harun, A., M., 2022](#)). Overall, the impact of COVID-19 on banking app satisfaction and usage in Bangladesh is a complex and multifaceted issue. More research is required to gain an understanding of the magnitude of these impacts and to devise approaches for improving customer satisfaction and engagement, in this emerging normalcy.

### **3. 1. 2. Impact of COVID-19 on Digital Banking:**

The digital banking sector in Bangladesh has experienced changes as a result of the COVID 19 presenting both positive and negative implications.

In light, there has been an increase in the number of registered mobile banking customers in Bangladesh (Chmielarz, W., 2021).

This growth can be attributed to the government's initiatives and efforts to enhance accessibility during this challenging time. The government has facilitated a range of mobile banking transactions including cash in cash-out, and person-to-person transfers as salary and utility bill payments (Chmielarz, W., 2021).

Additionally, banks have shifted their focus towards enhancing their applications since individuals are now compelled to rely on channels for their banking requirements (Kitsios F., Giatsidis I., Kamariotou M., 2021). Consequently, there has been a surge, in the usage of

banking apps as customers find it more convenient and secure to conduct transactions from the comfort of their homes.

The pandemic has led to a rise, in the use of banking apps, which can be viewed as a development signaling a move towards banking and a greater acceptance of technology-based financial services. However, it is important to recognize that the effects of COVID-19 on satisfaction and usage of banking apps, in Bangladesh are not universally positive (Chowdhury, A, S, M. et al., 2022)

### **3. 1. 3. Mobile Banking Apps: User Satisfaction Analysis:**

Studies conducted in Bangladesh have shown that the impact of COVID-19, on the satisfaction and usage of banking apps is not uniformly positive. While there has been a rise in the number of customers using banking and an increase in app usage there are also challenges that affect user's overall satisfaction. ([Harun, A. M., 2022](#)).

### **3. 1. 4. Trends in Mobile Banking Usage Post-COVID:**

Since the COVID-19 outbreak, there has been a surge in the use of mobile banking apps in Bangladesh (Chmielarz, W., 2021). This can be attributed to factors such as the convenience and safety of conducting transactions from home government initiatives promoting digital financial access during the pandemic and banks focusing more on their mobile banking apps (Chmielarz, W., 2021).

### **3. 1. 5. Comparative Study of Banking App Usage Before and After COVID-19:**

A comparative study examining app usage before and after COVID-19 in Bangladesh indicates a rise in post-COVID app usage (Oksana, K., Tetiana, G., & Tetiana, G., 2021). This increase can be attributed to factors like the need, for transactions the convenience of conducting

banking activities from home, and banks improving their app functionalities and user experience during these challenging times (Almajali et al., 2023).

### 3. 1. 6. Impact of Pandemic on Customer Satisfaction in Digital Banking:

The impact of COVID-19 on customer satisfaction in digital banking in Bangladesh has had a mixed outcome. On one hand, the rise in the use of mobile banking apps during this time suggests that people are increasingly accepting and relying on technology-driven financial services (Ahmed, S. Sur, S. 2021). This change isn't just due to physical interactions; it also highlights how consumers now prioritize convenience, accessibility, and seamless integration of digital solutions into their daily lives. As a result of this evolving consumer behavior, financial institutions have been investing heavily in improving their digital infrastructure, user interfaces, and security protocols to meet the growing expectations of customers who are becoming more discerning about their digital banking experiences. However, while the adoption of mobile banking apps is a trend it has also brought attention to challenges related to digital literacy, data security concerns, and the need for comprehensive user education (Harun A., M., 2022). Therefore, post-pandemic customer satisfaction in banking is at a crucial point where finding the right balance between technological innovation and user-centric design will shape the future of banking experiences, in Bangladesh (Anjum N., Saha J., 2020).

### 3.2. Research Gap:

The existing body of research mainly focuses on the holistic view of the change in digital banking of Bangladesh Banks. However, the literature in the literature review provides a wide understanding of the change in Digital banking frequency and customer satisfaction. However, some gaps in the research can be noticed, as the research tends to neglect the specific regional dimensions that could potentially unveil a distinct story.

The subsets of customers have specific behaviors regarding digital banking as the personality of the customers depends on the region they live. This gap becomes particularly evident when considering the regional behaviors, specifically the Prime Bank customers located in the unique context of Jatrabari.

### 3.3. Research Aim:

The purpose of this study is to see if there are any notable differences in app usage and overall customer satisfaction levels at the Prime Bank Jatrabari Branch before and after 2020. More particularly, as a result of the COVID-19 pandemic and the bank's improved digital banking capabilities. The study also tries to uncover which attributes of the app primarily affect the overall satisfaction score and what can be improved.

### 3.4. Research Objectives:

1. To compare the app usage frequency before and after the year 2020 at the Prime Bank Jatrabari Branch.
2. To assess changes in the overall customer satisfaction level before and after the year 2020 at the Prime Bank Jatrabari Branch.

3. To conduct a descriptive analysis of the likelihood of recommendations by the customers at Prime Bank's Jatrabari branch in the current year of 2023.

### 3.5. Research Questions:

1. Is there a significant difference in the app usage frequency before and after the year 2020 at the Jatrabari Branch?
2. Has there been a significant change in the overall customer satisfaction level before and after the year 2020 at the Prime Bank Jatrabari Branch?
3. What is the likelihood of the app recommendation at Prime Bank's Jatrabari branch in the year 2023?

### 3.6. Hypothesis:

#### - Null Hypotheses (H<sub>0</sub>):

1. There is no significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.
2. There is no significant change in the overall customer satisfaction level with the Prime Bank app at the Jatrabari Branch before and after the year 2020.

#### - Alternative Hypotheses (H<sub>A</sub>):

1. There is a significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.
2. There is a significant change in the overall customer satisfaction level with the Prime Bank app at the Jatrabari Branch after the year 2020.

### 3.7. Research Methodology:

#### 3.7.1. Research Design:

- **Longitudinal Design:** The study will involve collecting data from the same set of participants before and after the year 2020, allowing for a temporal comparison.
- **Mixed-Method:** A mixed-method approach will be used to combine quantitative data analysis and qualitative insights.

### 3.8. Data Collection:

#### 3.8.1. Data Collection Source:

- **Primary Data:** The research mostly contains primary data in the form of a questionnaire survey of the customer of Prime Bank Jatrabari branch customers. The survey was conducted with printed survey paper which was delivered to the samples and collected afterward.
- **Secondary Data:** The research also uses some secondary data like financial statement of the last 2 years which contains almost 4 years of financial data. This will help the recommendation section, as the paper needs to recommend based on the bank's financial condition.

### 3. 8. 2. Data Type:

#### 3. 8. 2. 1. Quantitative Data:

- **App Usage Records:** Using questioner the survey collects some quantitative data regarding app usage like their frequency of login every week.

- **Customer satisfaction:** Some quantitative data like the subject's rating regarding responsiveness, security privacy, etc.

#### 3. 8. 2. 2. Qualitative Data:

- **Customer Information:** Using the same survey some qualitative data was collected like their age range (exp. 18-25), gender, the subject's likeliness of recommending the app, and their thoughts on the app, and what can be improved.

### 3. 9. Sampling:

#### 3. 9. 1. Simple Random Sampling:

To conduct this research, simple random sampling was conducted. The population of the sample was all the people who used the Prime Bank app before the event covid-19 and still using the app meaning customers with a minimum of three years of account experience with Prime Bank. In addition, those customer needs to use the app through the years. The sample also accounts for the employees of the prime bank who fulfill the condition of the above. Lastly, to maintain the privacy of the participants, the information of them were kept secret so that the subject didn't fear giving a negative review.

### 3. 9. 2. Distribution of the sample:

They are Some demographic data were collected like gender and age range. This can be shown through the visualization below:

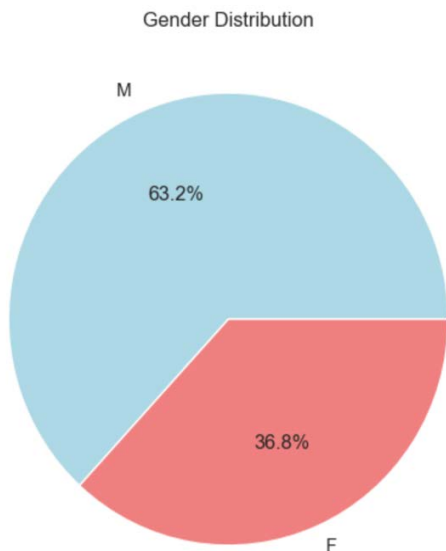


Figure 13: Gender Sample

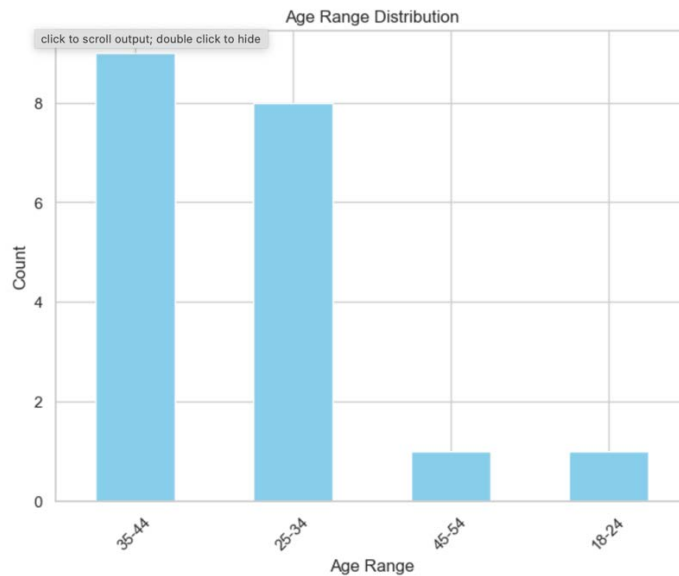


Figure 14: Age Sample

## 3. 10. Data Analysis:

### 3. 10. 1. Hypothesis 1:

**H<sub>0</sub>:** There is no significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.

**H<sub>A</sub>:** There is a significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.

#### 3. 10. 1. 1. Paired Sample T-Test Assumption Check:

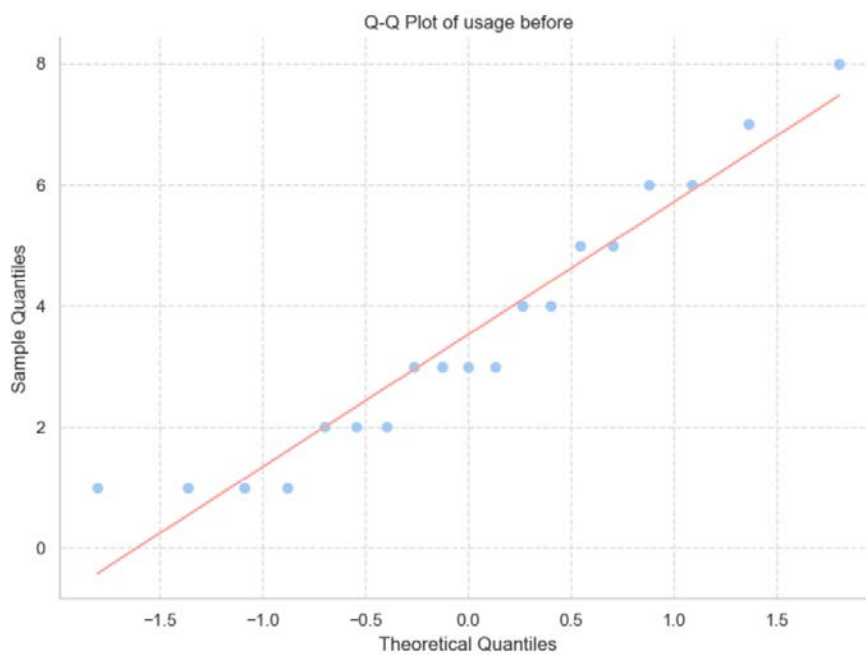
1. **Independence:** The condition is that each subject should be independent of one another. Meaning one choice should not influence another. To, prevent this the survey



was done using random sampling, and the use of randomization should ensure the independence of the sample.

2. **Normality:** To check the normality, some visualizations can direct us in the right direction.

QQ Plot is a good indication of normality. Here, if most of the data point stays around the reference line, then the data can be considered as normally distributed.



*Figure 15: Customer app usage QQ plot before COVID-19*

Here, the visualization shows that most of the data is around the reference line for the before-usage column.

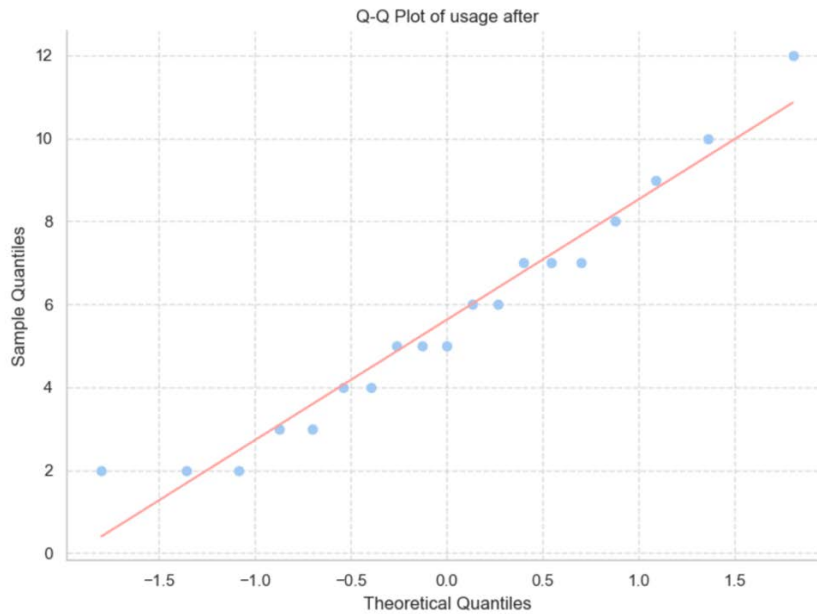


Figure 16: Customer Usage QQ plot after COVID-19

The QQ plot for usage after COVID-19 is also very close to the reference line. Although some of the data are a bit far away from the reference line.

For further investigation, let's check the KDE plot and histogram.

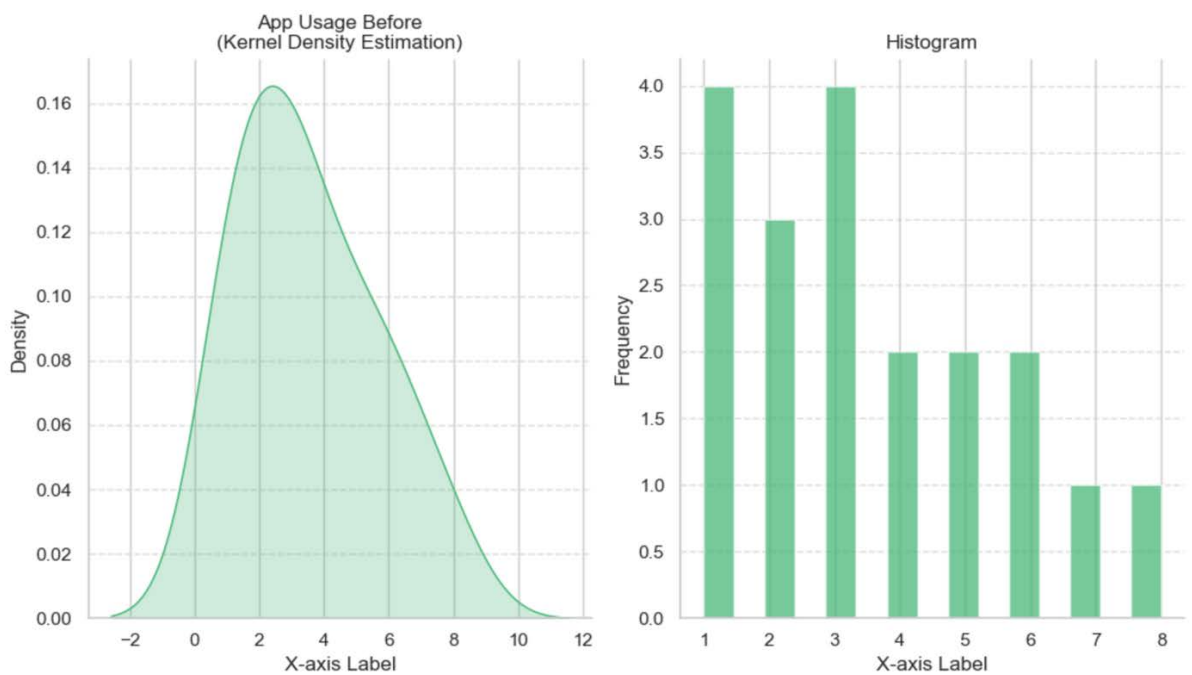


Figure 17: KDE plot of app Usage before COVID

The KDE plot shows that the data is approximately normal. However, it is a bit positively skewed the skewness is approximately 0.583. This is not a massive problem as approximately 19 samples have been collected.

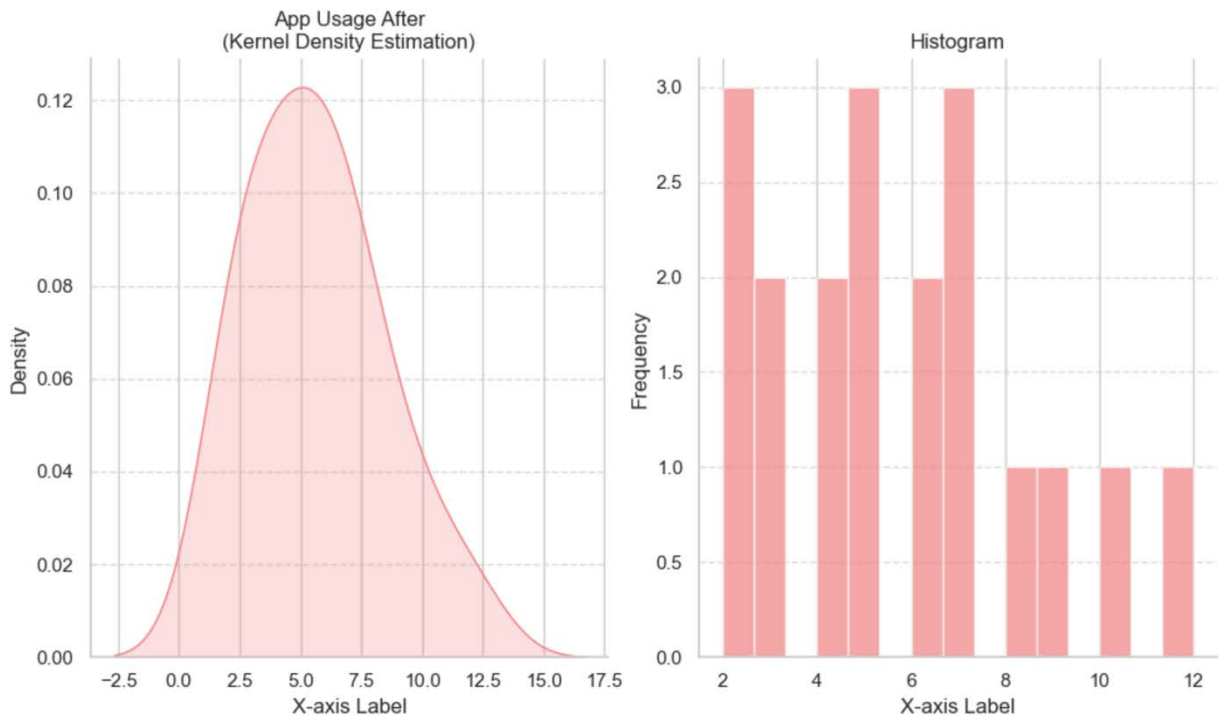


Figure 18: KDE plot of app Usage after COVID

The KDE plot shows that the data is approximately normal. However, it is a bit positively skewed the skewness is approximately 0.590. This is not a massive problem as approximately 19 samples have been collected.

3. **Outliers test:** To conduct a paired sample t-test it expects the data to be free from outliers or less of them.

To see check outliers the paper conducts a box plot to justify the condition. In the boxplot, the box indicates the middle 50% of the data it contains. The lower end of the box is the first quantile (Q1) or 25 percentile and the upper end of the box is the third quantile (Q3) or 75 percentiles. In the box, the solid line is the median. And lastly, there

are two T-shaped whiskers one for the upper side and one for the lower side. Any data outside of these whiskers are our potential outliers.

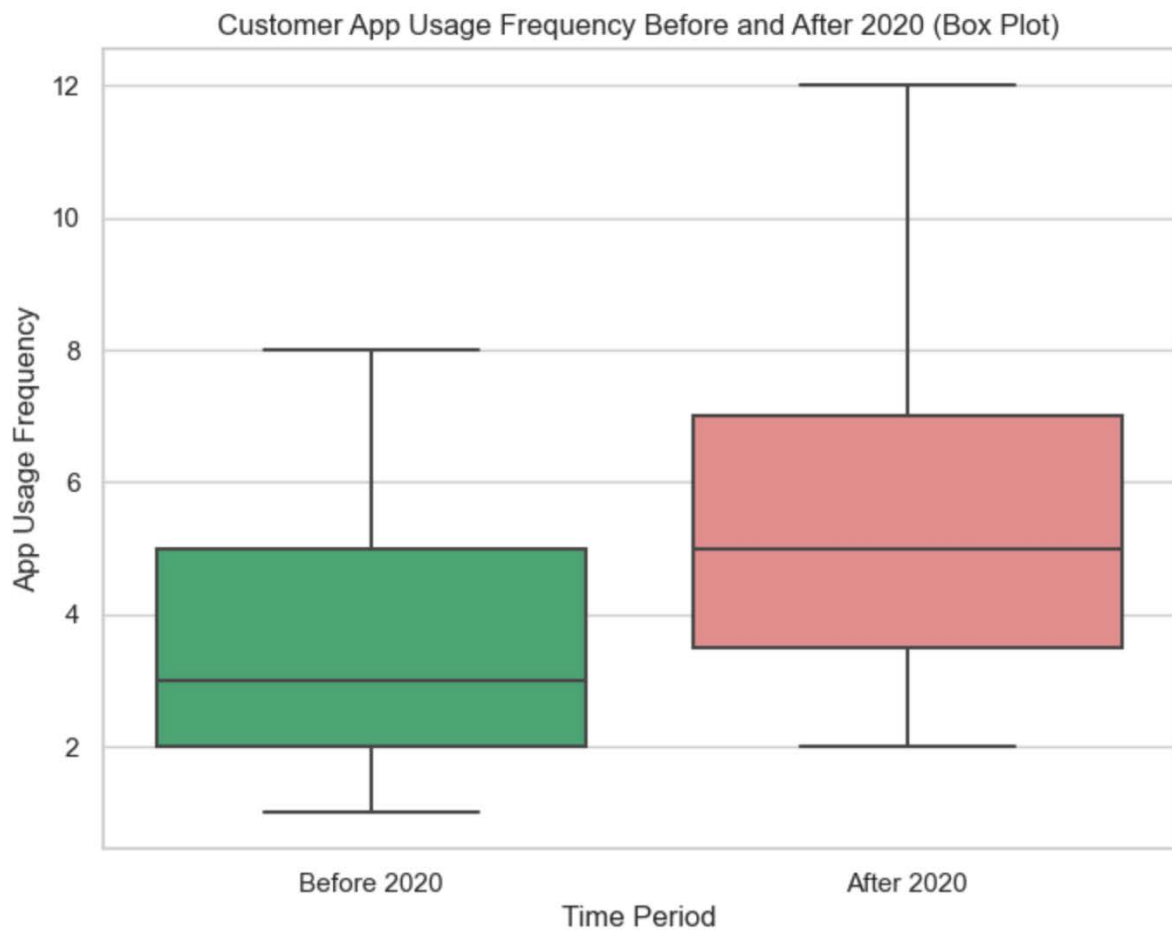


Figure 19: Box plot App usage before and after 2020

The visualization shows that there are no points outside of the whiskers meaning the data may not contain any outliers.

### 3. 10. 1. 2. Paired Sample T-Test:

The data were collected from a sample of 19 customers who utilized the bank's app. Descriptive statistics were calculated for both usage periods: before and after the year 2020. The mean and standard deviation of app usage metrics were examined to provide insights into the trends. The summary of these statistics is as follows:

- Usage Before (Mean): 3.53, Standard Deviation: 2.144, Standard Error of Mean: 0.492
- Usage After (Mean): 5.65, Standard Deviation: 2.813, Standard Error of Mean: 0.645

In this data the sample t-test mean difference is around -2.105, the standard deviation is around 3.414 and the standard error is around 0.783. The negative mean difference shows that there is a positive effect of covid 19 on customer usage. To confirm the increase, it is necessary to verify if the increase is statistically significant.

To confirm the significance, first, the t value should be greater than the critical value. The t value is 2.688(|t-value|) which is greater than the critical value 2.1009 meaning the mean difference of -2.105 is statistically significant from zero.

On the other hand, the larger the t-value more pronounced the difference and the smaller the p-value indicates the value did not happen by chance. As our  $\alpha$  is 0.05 and our p-value two-tailed is around 0.015, indicates that our p-value is less than 0.05 meaning the mean difference of -2.105 is statistically significant from zero.

Lastly, if our 95% confidence interval of difference has the same sign and none of them passes through zero meaning the mean difference is statistically significant from zero. Here, the lower value is around -3.751 and our upper value is around -0.460.

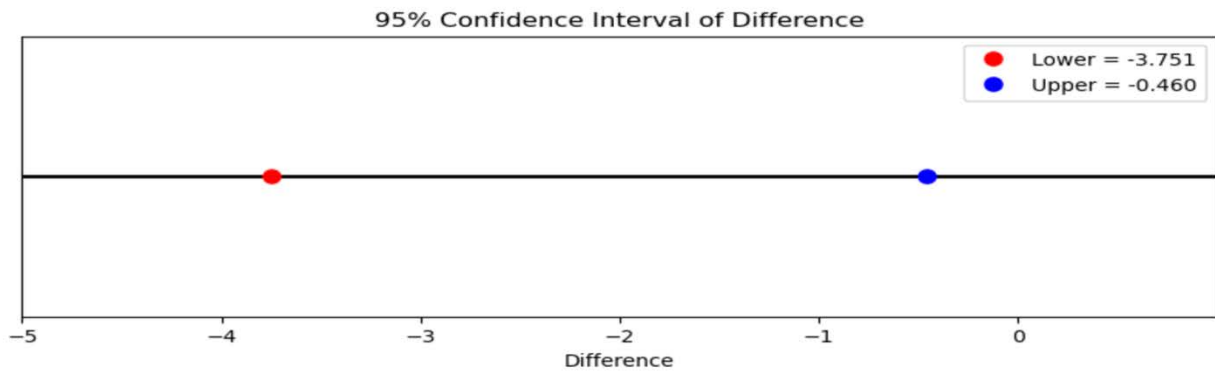


Figure 20: Confidence interval of difference plot

The visualization shows that neither of the values passes through zero and both of them are on the same side of the number line meaning the mean difference of -2.105 is statistically significant from zero.

Lastly, the critical effect size is around 0.847. According to Cohen's d criteria, an effect size greater than 0.8 indicates a large change. Here, the critical effect size  $> 0.8$ , meaning the effect of COVID-19 and app improvement had a large impact on the customer app usage.

The difference in the distribution is shown below:

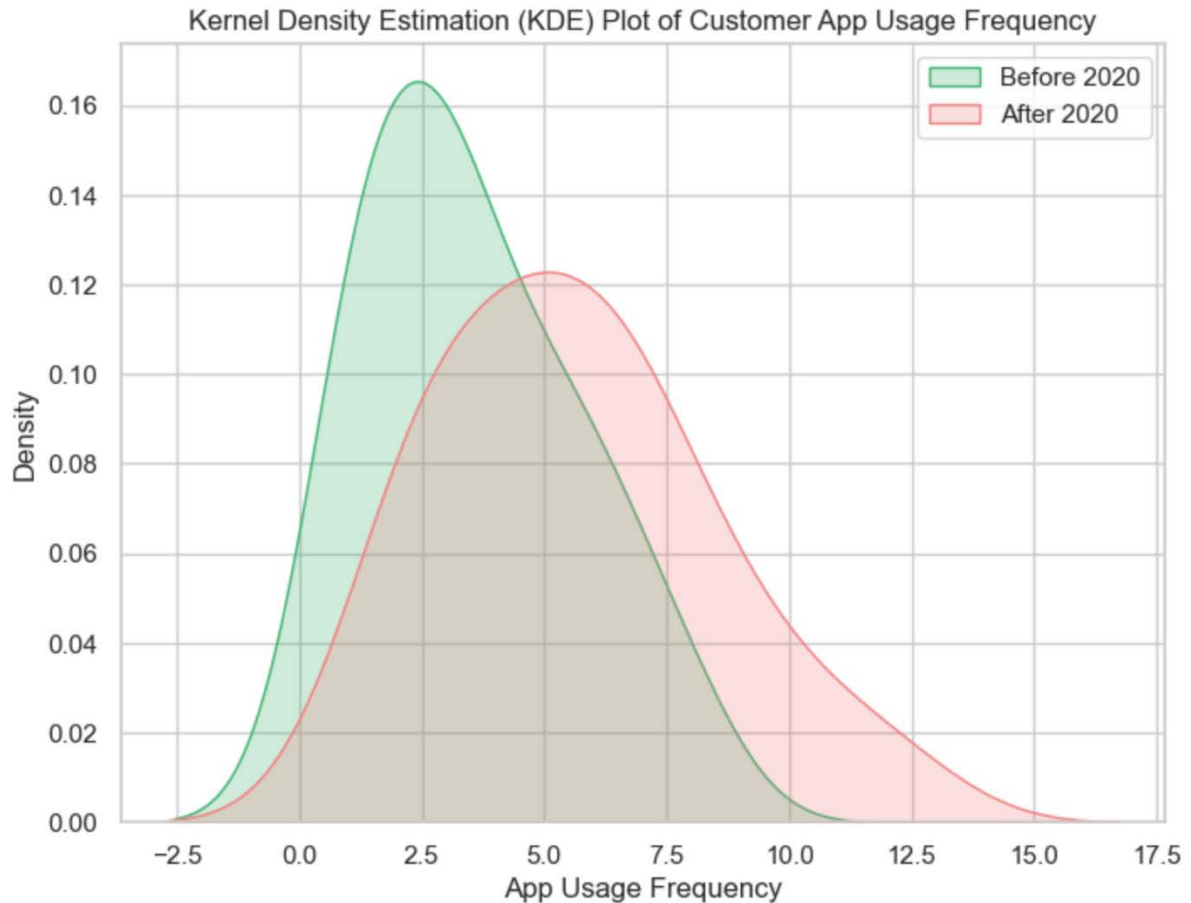


Figure 21: KDE comparison of app usage frequency before and after 2020

### 3. 10. 1. 3. Reporting results according to APA style 6th edition:

A paired samples t-test with a significance level ( $\alpha$ ) of .05 was employed to compare the mean usage, as measured by the weekly usage of the MyPrime app, among 19 customers of Prime Bank's Jatrabari branch before ( $M = 3.53$ ,  $SD = 2.144$ ) and after ( $M = 5.65$ ,  $SD = 2.813$ ) the COVID-19 strike in Bangladesh in 2020. Visual inspection of the histograms for both pre-and post-test scores and their differences indicated that the assumption of normality was not violated. The paired sample t-test revealed that on average, the customer weekly average in the post-test was 2.105 units higher, 95% CI [-3.751, -0.460] than the pre-test scores. The difference was statistically significant,  $t(19) = -2.688$ ,  $p < .05$  ( $p = 0.015$ ), two-tailed, and large,  $d = 18$ .

### 3. 10. 2. Hypothesis 2:

**H0:** There is no significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.

**HA:** There is a significant difference in the mean app usage metrics before and after the year 2020 at the Prime Bank Jatrabari Branch.

#### 3. 10. 2. 1. Paired Sample T-Test Assumption Check:

1. **Independence:** The condition is that each subject should be independent of one another. Meaning one choice should not influence another. To, prevent this the survey was done using random sampling, and the use of randomization should ensure the independence of the sample.
2. **Normality:** To check the normality, some visualizations can direct us in the right direction.

QQ Plot is a good indication of normality. Here, if most of the data point stays around the reference line, then the data can be considered as normally distributed.



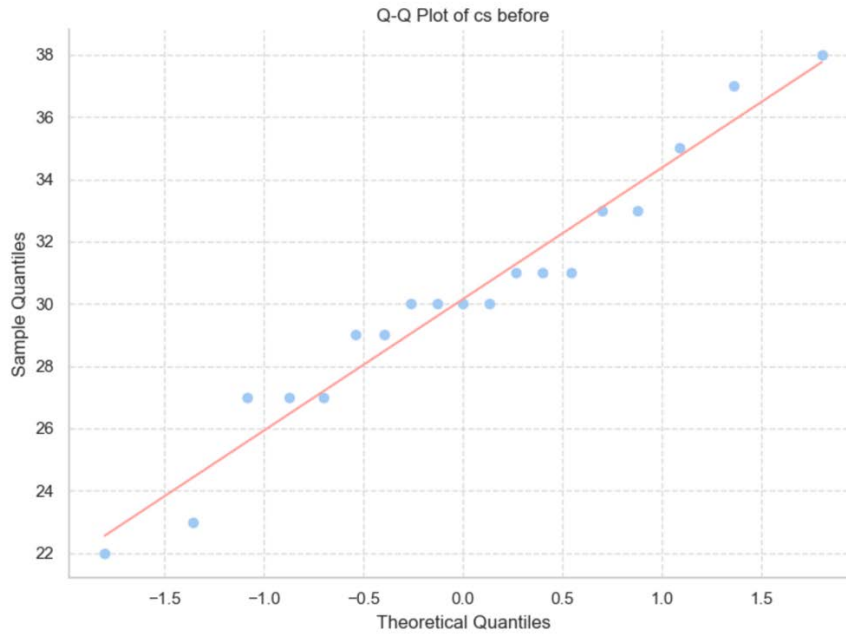


Figure 22: Customer app satisfaction QQ plot before COVID-19

Here, the visualization shows that most of the data is around the reference line for the customer satisfaction column before the covid in 2020. Indicating the data might be close to normal.

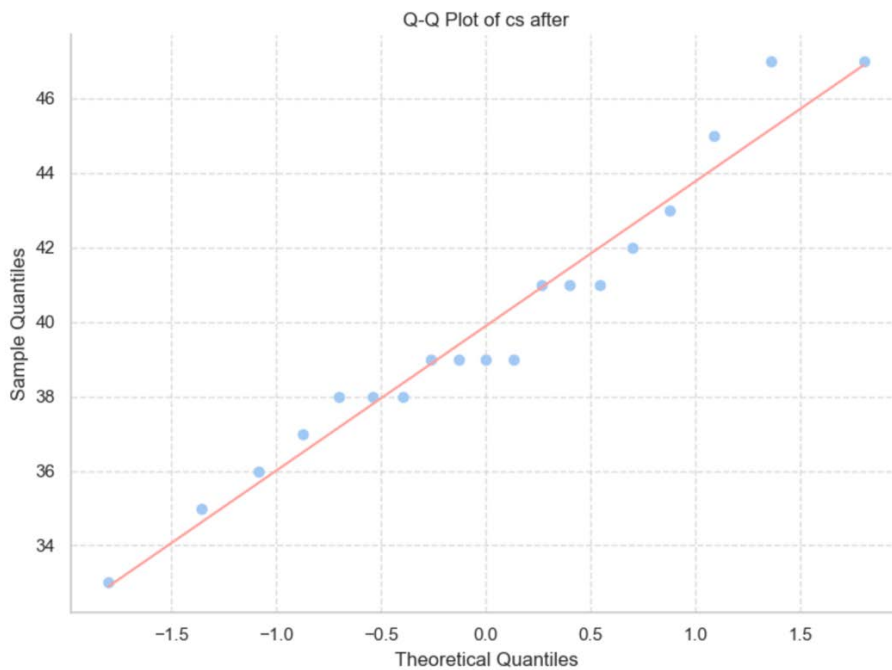
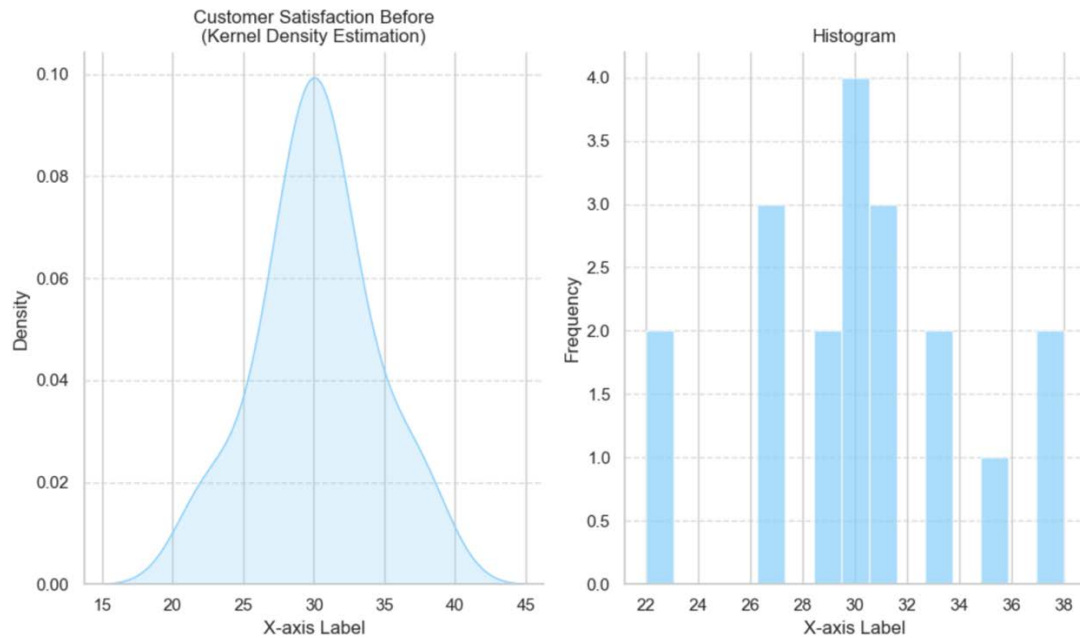


Figure 23: Customer app satisfaction QQ plot after COVID-19

The QQ plot for customer satisfaction after COVID-19 is also very close to the reference line. Although some of the data are a bit far away from the reference line.

For further investigation, let's check the KDE plot and histogram.



*Figure 24: KDE plot of app satisfaction before COVID*

The KDE plot shows that the data is approximately normal. The skewness is approximately -0.0395, which is almost 0 meaning that the data is mostly not skewed.

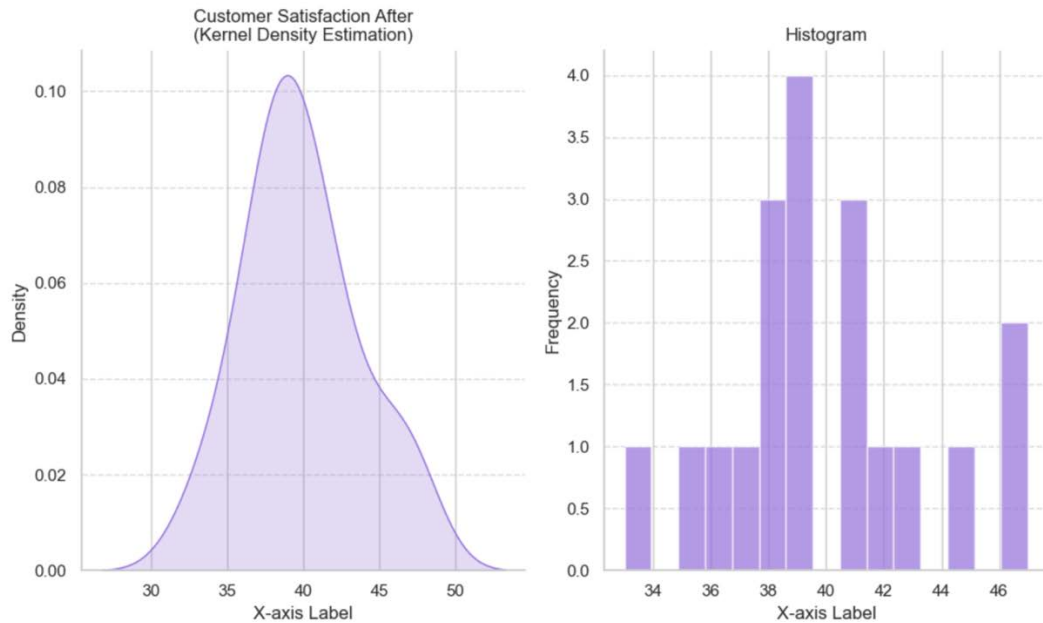


Figure 25: KDE plot of app satisfaction after COVID

The KDE plot shows that the data is approximately normal. However, it is a bit positively skewed the skewness is approximately 0.401. This is not a massive problem as approximately 19 samples have been collected.

3. **Outliers test:** To conduct a paired sample t-test it expects the data to be free from outliers or less of them.

To see check outliers the paper conducts a box plot to justify the condition. In the boxplot, the box indicates the middle 50% of the data it contains. The lower end of the box is the first quantile (Q1) or 25 percentile and the upper end of the box is the third quantile (Q3) or 75 percentiles. In the box, the solid line is the median. And lastly, there are two T-shaped whiskers one for the upper side and one for the lower side. Any data outside of these whiskers are our potential outliers.

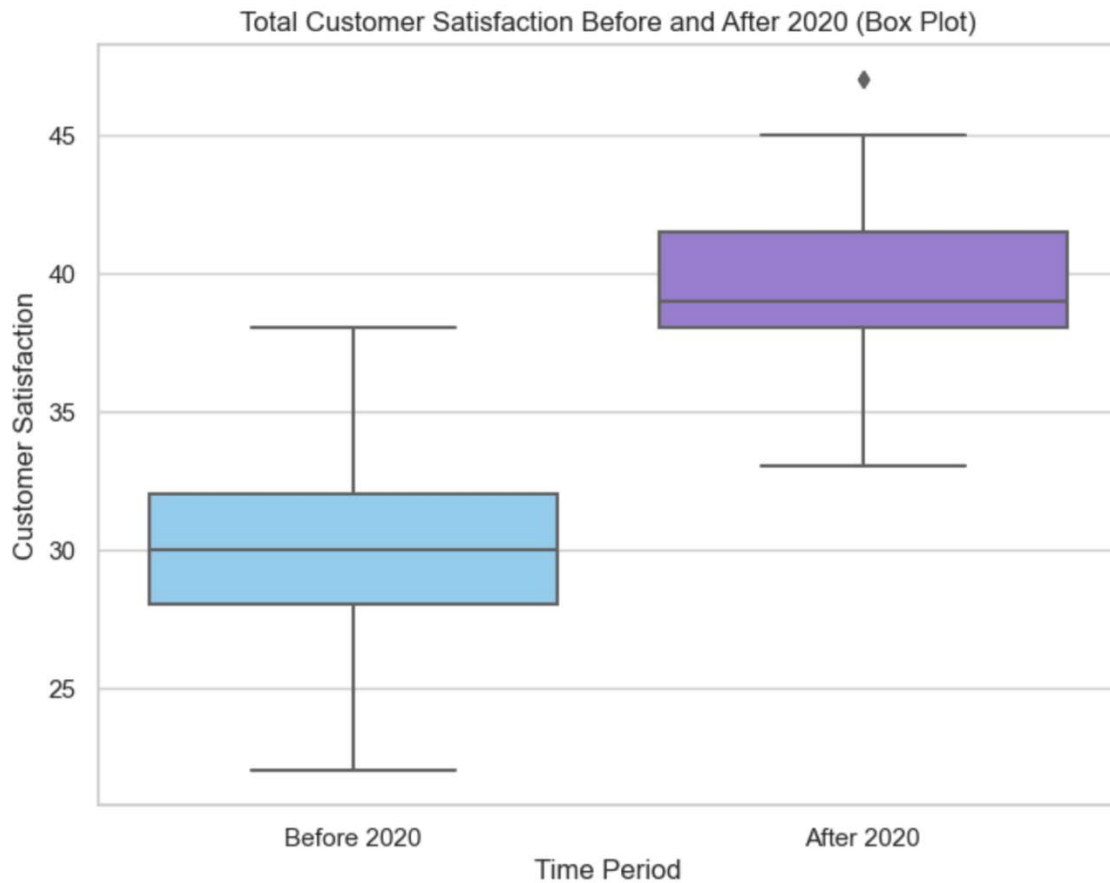


Figure 26: Box plot App satisfaction before and after 2020

The visualization shows that there are almost no points outside of the whiskers meaning the data may not contain any outliers. Meaning with those data now we can conduct paired sample t-tests.

### 3. 10. 2. 2. Paired Sample T-Test:

The data were collected from a sample of 19 customers and computed the total customer satisfaction. Descriptive statistics were calculated for both usage periods: before and after the year 2020. The mean and standard deviation of app satisfaction metrics were examined to provide insights into the trends. The summary of these statistics is as follows:

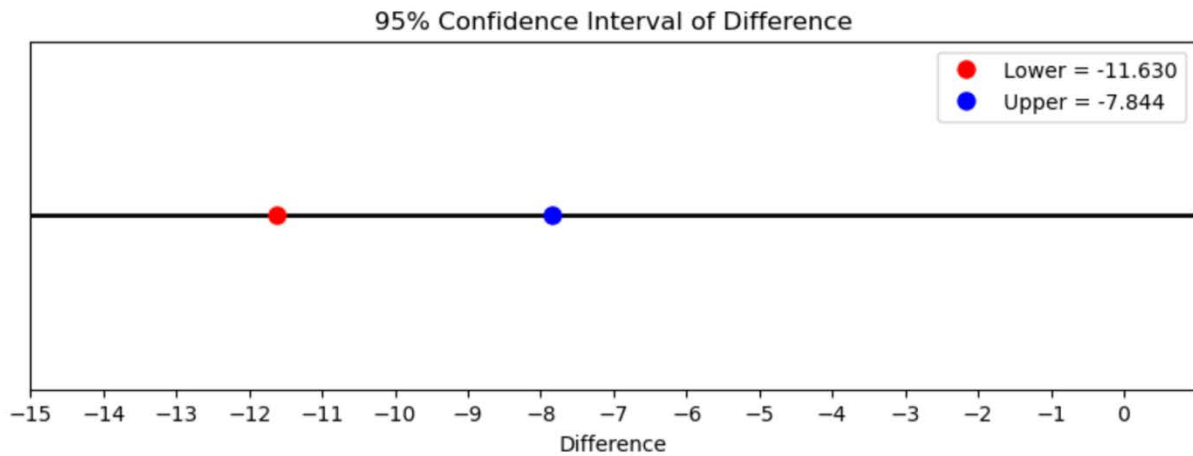
- Usage Before (Mean): 30.16, Standard Deviation:  $\pm 4.086$ , Standard Error of Mean:  $\pm 0.937$
- Usage After (Mean): 39.89, Standard Deviation:  $\pm 3.755$ , Standard Error of Mean:  $\pm 0.861$

In this data the sample t-test mean difference is around  $-9.737$ , the standard deviation is around  $\pm 3.928$  and the standard error is around  $\pm 0.901$ . The negative mean difference shows that there is a positive effect of covid 19 on customer satisfaction. To confirm the increase, it is necessary to verify if the increase is statistically significant.

To confirm the significance, first, the t value should be greater than the critical value. The t value is  $10.806$  (|t-value|) which is greater than the critical value  $\pm 2.1009$  meaning the mean difference of  $-9.737$  is statistically significant from zero.

On the other hand, the larger the t-value more pronounced the difference and the smaller the p-value indicates the value did not happen by chance. As our  $\alpha$  is  $0.05$  and our p-value two-tailed is  $< 0.001$ , indicates that our p-value is less than  $0.05$  meaning the mean difference of  $-9.737$  is statistically significant from zero.

Lastly, if our 95% confidence interval of difference has the same sign and none of them passes through zero meaning the mean difference is statistically significant from zero. Here, the lower value is around  $-11.630$  and our upper value is around  $-7.844$ .



*Figure 27: Confidence interval of difference plot*

The visualization shows that neither of the values passes through zero and both of them are on the same side of the number line meaning the mean difference of -9.737 is statistically significant from zero.

Lastly, the critical effect size is around 2.48. According to Cohen's d criteria, an effect size greater than 0.8 indicates a large change. Here, the critical effect size  $> 0.8$ , meaning the effect of COVID-19 and app improvement had a large impact on customer app satisfaction.

The difference in the distribution is shown below:

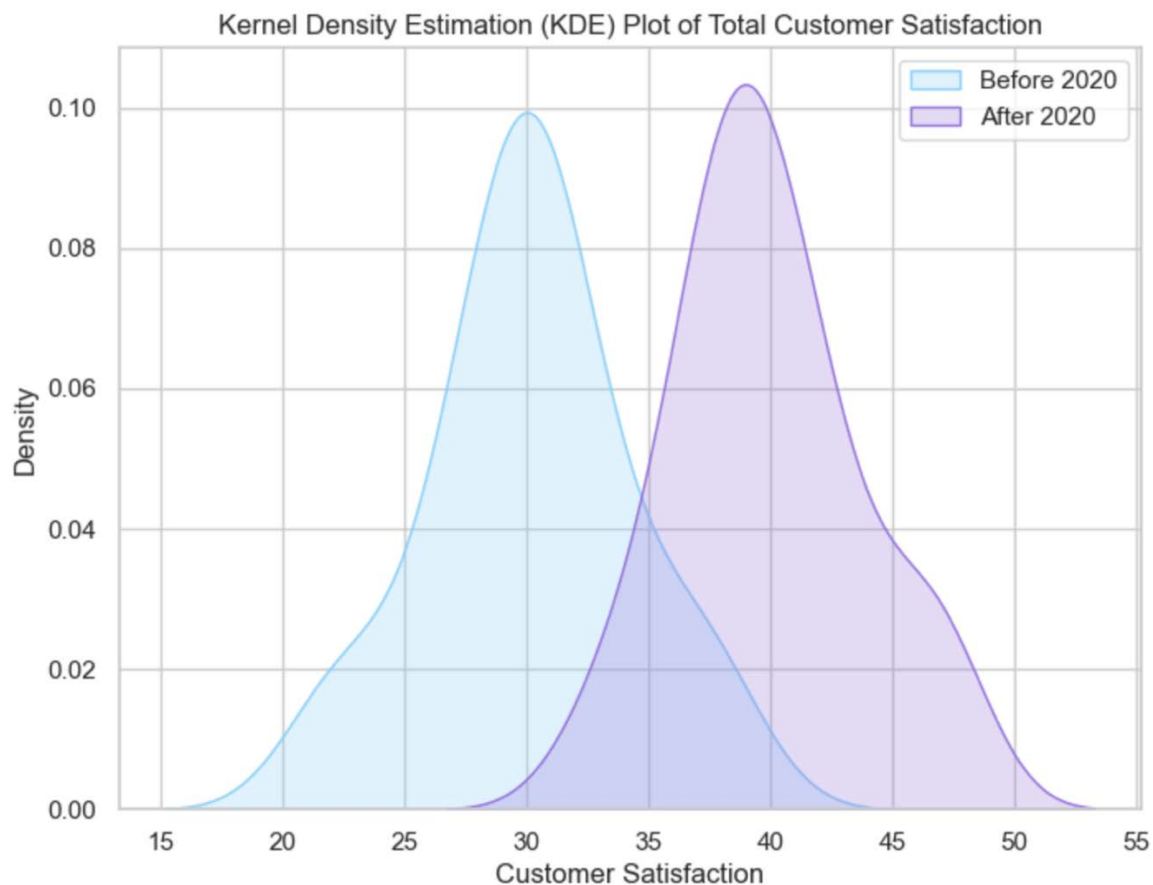


Figure 28: KDE comparison of app satisfaction before and after 2020

### 3. 10. 2. 3. Reporting results according to APA style 6th edition:

A paired samples t-test with a significance level ( $\alpha$ ) of .05 was employed to compare the mean customer app satisfaction, as measured by the total score given by a customer of the MyPrime app, among 19 customers of Prime Bank's Jatrabari branch before ( $M = 30.16$ ,  $SD = \pm 4.086$ ) and after ( $M = 39.89$ ,  $SD = \pm 3.755$ ) the COVID-19 strike in Bangladesh in 2020. Visual inspection of the histograms for both pre and post-test scores and their differences indicated that the assumption of normality was not violated. The paired sample t-test revealed that on average, customer satisfaction averages in the post-test were 9.737 units higher, 95% CI [-11.630, -7.844] than the pre-test scores. The difference was statistically significant,  $t(19) = -10.806$ ,  $p < 0.001$  two-tailed, and large,  $d = 18$ .

### 3. 10. 3. Key insights:

Recommendation Likelihood: The current recommendation likelihood can be visualized using a bar chart.

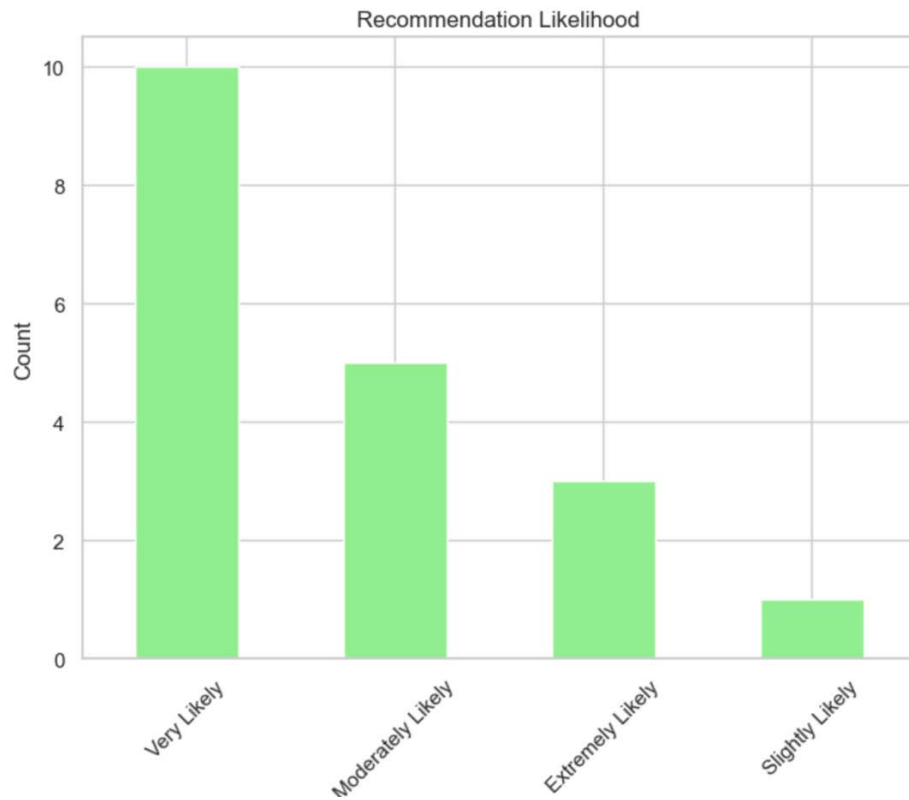


Figure 29: Recommendation likelihood chart

Here, we can see that most of the customers said they would very likely recommend the app to others. The second is moderately likely. How about the likelihood recommendation based on the custom gender? From the visualization below it can be shown:



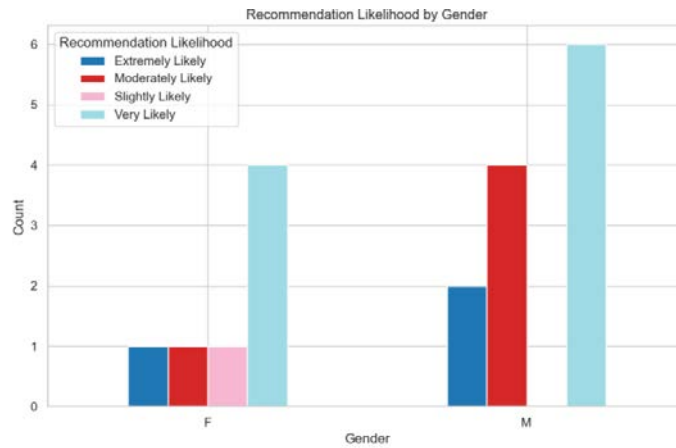


Figure 30: Recommendation likelihood by gender chart

Here, an interesting insight is that there is no male customer who gave a “Slightly likely” recommendation for the app. For both parties, most of the people gave “Very likely” which is the second highest in this ordinal data. Lastly, age range can be an interesting thing to be considered:

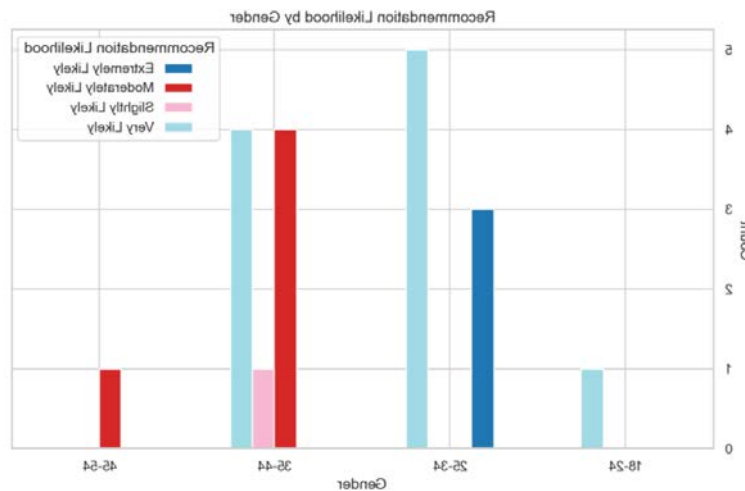


Figure 31: Recommendation likelihood by age

Here, a fascinating insight is that only people who gave slight which is the lowest in the order likely are the people within the range of 35-44. And only the people in the range of 25-34 gave the extremely likely score which is the highest in the order.

### 3. 11. Theoretical Insights:

1. **Impact of COVID-19:** The insights from customer satisfaction and customer usage before and after COVID-19 suggest that the pandemic had a notable impact on customer interaction with the app of bank.
2. **Customer Behavior Shift:** The 2.105 unit increase in customer usage occurred due to the behavioral shift after covid lockdown which forced them to rely on the app and build trust. Due to that some customers are now more comfortable with the app and maybe they have realized that some trivial tasks can be completed safely from the home.
3. **Satisfaction and Loyalty:** The substantial increase in customer app satisfaction by 9.737 after COVID-19 may have occurred due to the bank's digital banking focus approach. After covid-19 strike the entire country had an epiphany that offline tasks can be hampered at any time and companies should have a backup plan or a way to conduct operations online. Due to that, the bank started to improve its digital banking and maybe that helped the bank to have higher customer app satisfaction.

### 3. 12. Recommendations:

1. **Digital Transformation:** The bank should continue its digital service as the space in the branch is limited and sometimes in rush days the branch gets very crowded which can be a bit more avoidable as people start using the app. From the data it is clear that the bank already has an impressive product, it would be beneficial if more customers started to use the service.

- 2. Customer Support:** As more customers start to use the app, customers must get customer support easily from the app 24/7. This will help the company to build more trust among the users.
- 3. Security Measures:** Security is one of the most important aspects of a banking app as it is about people's savings. Security is a factor that the MyPrime app is already good at as the app has a fingerprint login which is a secure way to log in without sacrificing the ease of use. However, there is still room for improvement as security is a continuous process.
- 4. Promotion and Training:** The best functional app is no use if no one knows about its existence. As a result, it is easy to say that promotion of the app or in other words app marketing is crucial for an app. However, only promotion is not enough as it is also important to educate the customers on how to use it. It is more important for the branches like Jatrabari where a lot of customers come from uneducated or not-so-tech-expert groups.
- 5. Regular Assessments:** Regular measurement of the app matrices can be crucial for the app's success. It will help the company to understand its current performance and customer mentality.
- 6. Competitive Benchmarking:** Comparing the matrices like customer app usage and satisfaction is necessary as there are a lot of competitors for MyPrime apps. Through this, the company can identify its strong and weak sides and take appropriate steps according to that.

## 4. References

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## 5. Appendix A.

- effect size(d) =  $M1 - M2 / S_p$  ( $M1$  = pre-test mean,  $M2$  = post-test mean,
- $S_p$  = pooled SD or  $SD1+SD2/2$ )
- Usage effect size =  $3.53-5.63 / [(2.144+2.813)/2]$
- satisfaction effect size =  $30.16-39.89 / [(4.086+3.755)/2]$

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	total_satisfaction_before	30.16	19	4.086	.937
	total_satisfaction_after	39.89	19	3.755	.861

**Paired Samples Correlations**

		N	Correlation	Significance	
				One-Sided p	Two-Sided p
Pair 1	total_satisfaction_before & total_satisfaction_after	19	.501	.014	.029

**Paired Samples Test**

		Paired Differences				95% Confidence Interval of the Difference		t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	One-Sided p			Two-Sided p	
Pair 1	total_satisfaction_before - total_satisfaction_after	-9.737	3.928	.901	-11.630	-7.844	-10.806	18	<.001	<.001	

**Paired Samples Effect Sizes**

		Standardizer <sup>a</sup>	Point Estimate	95% Confidence Interval		
				Lower	Upper	
Pair 1	total_satisfaction_before - total_satisfaction_after	Cohen's d	3.928	-2.479	-3.391	-1.550
		Hedges' correction	4.101	-2.374	-3.247	-1.485

a. The denominator used in estimating the effect sizes.  
Cohen's d uses the sample standard deviation of the mean difference.  
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

**Paired Samples Statistics**

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	usage_before	3.53	19	2.144	.492
	usage_after	5.63	19	2.813	.645

**Paired Samples Correlations**

		N	Correlation	Significance	
				One-Sided p	Two-Sided p
Pair 1	usage_before & usage_after	19	.071	.387	.773

**Paired Samples Test**

		Paired Differences				95% Confidence Interval of the Difference		t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	One-Sided p			Two-Sided p	
Pair 1	usage_before - usage_after	-2.105	3.414	.783	-3.751	-.460	-2.688	18	.008	.015	

**Paired Samples Effect Sizes**

		Standardizer <sup>a</sup>	Point Estimate	95% Confidence Interval		
				Lower	Upper	
Pair 1	usage_before - usage_after	Cohen's d	3.414	-.617	-1.102	-.117
		Hedges' correction	3.565	-.591	-1.055	-.112

a. The denominator used in estimating the effect sizes.  
Cohen's d uses the sample standard deviation of the mean difference.  
Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.