



Impact of Virtual Banking Services on Service Quality and Customer Satisfaction at Punjab National Bank Ltd. with Special Reference to Ernakulam District

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Abstract

The Indian banking sector has undergone significant transformations with the advent of digital technologies. One of the largest public sector banks in India, Punjab National Bank Ltd. (PNB), has made virtual banking a key component of its service portfolio. This study looks at how PNB's online banking services affect client happiness and service quality, specifically in the district of Ernakulam. Those clients who use virtual banking can enjoy such benefits as round-the-clock availability of services, fast money transfers, and minimal need for physical branches. The challenge, however, is to fulfill the client's expectations regarding the important aspects of service quality, such as reliability, tangibility, certainty, responsiveness, and empathy. This research study aims at exploring both the qualitative and quantitative data in order to assess the customers' perceptions. A structured survey of 200 PNB customers was administered to collect data from respondents. The findings of the study reveal that while virtual banking services enhance the efficiency and ease of doing business, PNB's customer service, particularly in terms of responsiveness and empathy, has been found to be lacking. The results of the study also show that it is important to consider both the technological platform and the human component in order to enhance customer loyalty and happiness in the digital environment. The study concludes that in order to build on its virtual banking offerings, PNB must focus on improving both the digital platform and the personalized services.

Keywords: Virtual Banking, Digital Era, Customer Satisfaction & Service Quality

1. Introduction

Digital or virtual banking means that clients can receive and manage financial services from electronic platforms with no need to visit a bank physically. Virtual banking has become possible due to the advancement in the use of digital tools, telecommunication devices and the Internet network. This change has been embraced by PNB a public bank in India, to extend online banking services to both the urban and semi-urban population. PNB has reduced the need for in-person encounters and has improved the client experiences with its online banking, mobile banking, and virtual assistance among

others. Even though PNB's virtual banking technology offers immediate benefits like speed and convenience, it also poses major questions on how it may affect consumer fulfilment and service quality. Typical banking frequently centres on face-to-face communication, when clients can speak with employees directly to address challenges. On the other hand, the impersonal character of virtual banking makes it challenging to provide the same degree of service. With an emphasis on crucial traits including certainty, attentiveness, dependability, empathy, and tangibility, this study assesses the impact of PNB's virtual banking services on customer satisfaction in the Ernakulam District. The study intends to provide insights into how PNB may enhance virtual services to effectively satisfy customer expectations through analysing customer perceptions.

2. Objectives of the study

- With a focus on the Ernakulam District, investigate the impact of virtual banking services on Punjab National Bank Ltd.'s overall service quality.
- To assess how satisfied customers are with PNB's online banking services in terms of numerous facets of service quality, including dependability, responsiveness, empathy, assurance, and tangibility.
- To identify the primary factors affecting customer happiness and loyalty in the context of online banking.
- To look at areas where PNB's online banking products fall short of consumer expectations and provide remedies that enhance client satisfaction.

2.1. Assessing the Impact of Virtual Banking on Service Quality and Customer

Satisfaction: Key Drivers, Customer Feedback, and Strategic Improvements Analyze the impact of virtual banking services on service quality This objective is to evaluate the effects of integrating online resources, like internet and mobile banking, on Punjab National Bank's (PNB) overall service quality. Keeping customers' faith in online banking depends on how well the bank performs in crucial areas like The study measures three factors: system stability, transaction efficiency, and service uptime.

Assess customer satisfaction across service quality dimensions: With the goal to examine customer opinions on a variety of service quality elements, the SERVQUAL model-which incorporates tangibility, assurance, responsiveness, empathy, and dependability-is used. Identifying the regions where customers are the happiest and least satisfied as the goals encompass how successfully PNB's digital banking services function in every sector.

Identify key factors driving customer satisfaction and loyalty: The objective is to pinpoint the specific aspects of PNB's banking services via the internet that have the largest impact on customer satisfaction and long-term loyalty. In the competitive world of digital banking, the study brings insights into the factors which assist in maintaining clients by analyzing what customers enjoy such ease of use, mobile app performance, or transaction security.

Explore shortcomings and suggest improvements: The study examines the variations between what consumers desire and what is actually offered, particularly in areas as customer service and tailored offerings. The report offers proposals to enhance live help options, customizing offerings, and app usability and performance to enhance PNB's online banking experience in reaction to customer suggestions.

3. Literature Review

3.1 Introduction to Virtual Banking

Banks have been able to switch from usual branch-based banking to a more flexible, 24*7 virtual environment via the development of the internet and mobile technological advancements. Digital

banking, or virtual banking, is the delivery of banking services. Services via online platforms, allowing people to deal with the funds without going to a branch in person. Customers may contact customer service and complete operations like cash transfers, bill payments, and loan applications whenever it is most convenient for them with the use of services like online banking and mobile banking apps.

One of the biggest public sector banks in India, Punjab National Bank Ltd. (PNB), has rendered virtual banking a crucial part of its service portfolio. PNB's online banking interface offers a wide range of services intended to improve customer convenience while preserving strong standards for safety. Nevertheless, there are disadvantages to shifting to online banking, especially terms of retaining the level of customer service that customers are accustomed to from traditional banking. The impact of virtual banking on customer satisfaction and service quality, particularly with regard to PNB, will be investigated in this review of the literature.

3.2 Evolution of Virtual Banking

Virtual banking has evolved progressively since the late 20th century with the introduction of telebanking and Automated Teller Machines (ATMs). The advent of internet banking in the 1990s was the first significant turning point in virtual banking, enabling users to do simple financial operations online. The emergence of mobile banking in the early 2000s revolutionized the consumer experience by making financial services accessible via smartphones and tablets. Almost all banking operations may now be completed online thanks to the fully integrated digital infrastructure that banks like PNB provide.

Some of the factors contributing to the rapid growth of virtual banking in India involve an increase in the number of tech-savvy individuals, government initiatives like Digital India, and broadening smartphone penetration. To cope with an increasing number of customers who prefer the convenience of internet PNB has been investing much in its digital infrastructure in the banking industry. One of the oldest and most reputable banks in India, PNB, has always adapted to recent advancements in technology, and a major part of its plans for increasing customer satisfaction has been its digital transformation.

3.3 Service Quality in Virtual Banking

According to the SERVQUAL model (Parasuraman et al., 1988), the banking industry has historically used characteristics including tangibility, assurance, responsiveness, empathy, and dependability to gauge service quality. These factors are equally significant in online banking, where a new approach to customer service is required due to the lack of in-person encounters. In the context of online banking, reliability is the bank's capacity to deliver accurate, timely, and dependable services. High levels of dependability are guaranteed by Punjab National Bank's virtual banking platform, which has strong mechanisms for error-free transactions, secure login processes and round-the-clock banking services availability. The bank also incorporates system backups in order to reduce downtime and ensure uninterrupted availability even during busy times. The primary factor influencing consumers is reliability, contentment with online banking, as per Ariff et al. (2013)'s study. This goes true for PNB likewise.

The capability of the bank to respond promptly to queries and complaints from customers is another crucial component. Despite the fact that virtual platforms, like PNB's mobile app, provide a useful way to perform transactions, response often becomes troublesome when customers have issues. A number of banks, including PNB, utilize chat bots and other automated technology to respond to customer inquiries. However, consumers usually believe that these advancements are not enough to solve complex problems, which reduces customer satisfaction. Research such

as Zeithaml et al. (2013) highlights the value of quick and efficient customer support in online settings. Assurance in virtual banking is an individual's trust in the bank's security. Assurance, or the customer's trust in the bank's safety precautions and expertise, is crucial in virtual banking. Punjab National Bank has made huge investments in cybersecurity, including strategies like dual-factor authentication in order for safeguarding customer data, fraud detection systems, encrypted transactions, and authentication. Customers are more likely to trade digitally if they think their data is safe, according to a study by Sakhaei et al. (2014), and assurance is a key component in deciding confidence in virtual banking. Empathy is the term used to describe the individual service that the bank provides. One instance of empathy in action is the personal connections that customers have with bank staff in traditional banking. However, the lack of this face-to-face interaction in online banking makes offering personalized assistance more challenging for institutions like PNB. Customers often claim that PNB's online platforms don't offer the same personalized attention as local branches, considering the fact that the services are effective. This is a prevalent problem in virtual banking, where banks need to come up with creative techniques to mimic human interactions, according to studies by Yoon and Kim (2021).

Digital platforms' usability and design mirror tangible services, or the actual manifestation of a bank's offerings. Customers' opinions of tangibility are greatly influenced by PNB's website and mobile app. Consumers anticipate an intuitive user interface, speedy navigation, and visually appealing designs. Although some customers have requested speed increases and more capabilities, PNB's mobile app has been praised for its clear UI. Tangibility is a crucial component of virtual banking as a well-designed digital platform may improve the entire client experience, according to research by George and Kumar (2014).

3.4 Customer Satisfaction in Virtual Banking

The perceived quality of the bank's online services has a big impact on how satisfied customers are with virtual banking. The most often mentioned characteristics in the numerous research that have looked at the connection between customer happiness and service quality in virtual banking are convenience of use, security, and dependability (Firdous & Farooqi, 2017; Singh, 2019). These elements are especially crucial for Punjab National Bank, which aims to keep clients in the face of a more cutthroat online environment.

The user's experience with the bank's digital platform is the main factor influencing consumer satisfaction in virtual banking, claim Kadir et al. (2011). Customers of PNB have expressed great satisfaction with the bank's mobile banking offerings, stating two of its main advantages are transaction security and dependability. In order to improve satisfaction, however, aspects like customization and quick service to customers must be enhanced.

Studies suggest that the lack of in-person interactions associated with online banking could adversely affect customer satisfaction (Sakhaei et al., 2014). The challenge a mission PNB aims to imitate the customized service that frequently occurs in branches using its virtual platforms. Examples of personalization technology that might span this gap and increase customer loyalty include AI-driven referrals and tailored financial advice.

3.5 Challenges in Virtual Banking

Although virtual banking offers several advantages, Punjab National Bank and other organizations must also take into account its disadvantages. Security is a major concern since internet platforms are susceptible to cyber attacks and data leaks. Using advanced encryption techniques with fraud monitoring systems, PNB has made significant improvements in lowering these risks; yet, the bank and its customers remain worried about possibilities for cybercrime.

Another hurdle is customer acceptableness, particularly for aging or less tech-savvy customers who can be unwilling to move from traditional banking methods to digital platforms. In order for PNB to increase the usage of its online banking services, it has to nurture digital literacy alongside interfaces that are easy to use.

Lastly, the lack of human connection in virtual banking continues to be an important hindrance to customer happiness. PNB has chatbots and automated systems in place, but they aren't always sufficient to meet customer needs. Live chat might be used to remedy this issue capabilities and offering a closer line to engage with customer service representatives.

3.6 Summary

Due to virtual banking, which offers customers more speed, flexibility, and convenience, the banking industry has changed. Punjab National Bank Ltd. has played a significant role in this shift by investing in digital platforms that satisfy a range of customer demands. But as this review of the literature illustrates, switching to online banking comes with distinctive difficulties, particularly in maintaining high standards for customer happiness and service quality. PNB will need to solve issues with immediacy, individualization, and security if it wants to keep customer loyalty in the digital age. With more technical investments and customer-focused plans, PNB might further cement itself as the pioneer in online banking.

4. Research Methodology

4.1 Research Design

This study uses a method of quantitative research to have a look at Punjab National Bank Ltd.'s (PNB) customer satisfaction and virtual banking service quality. The research evaluates how PNB's virtual banking platform—more especially, its online banking, mobile banking app, and virtual support—meets or fails to fulfill consumer expectations in important service quality categories by concentrating on clients in the Ernakulam District. In order to statistically analyze customer satisfaction based on their experiences, data from consumers who have used PNB's virtual banking services was gathered using a cross-sectional survey technique.

4.2 Sampling and Data Collection

Two hundred Punjab National Bank Ltd. clients who have utilized virtual banking services in the last six months were chosen at random to be included in the sample. Given that PNB has a significant presence in Ernakulam District, the bank's large customer base provides a suitable pool for examining virtual banking experiences. With a 95% confidence level and a 5% margin of error, this sample size guarantees that the results may be extrapolated to the larger PNB customer base.

Those who were selected received an electronic version of a standardized questionnaire. Three categories comprised demographic information, SERVQUAL model-based consumer opinions of service quality, and general satisfaction with PNB's virtual financial services. Reliability, responsiveness, assurance, empathy, and tangible aspects of service quality were rated by respondents on a Likert scale with 1 indicating "strongly disagree" and 5 denoting "strongly agree."

4.3 Data Analysis Techniques

Data was analysed using SPSS software, with descriptive and inferential statistics applied to interpret the results. Descriptive statistics such as means and standard deviations were first used to provide an overview of the sample characteristics. The correlations between the various aspects of service quality and total customer satisfaction with PNB's virtual banking services were then investigated using Pearson correlation analysis. Ultimately, the characteristics that had the most

effects on satisfaction levels were determined via regression analysis. For instance, the study assessed the relationship between overall customer happiness and the dependability of PNB's mobile banking service.

5. Data Analysis and Interpretation

5.1 Descriptive Statistics

According to the research, the vast majority of clients (65%) expressed great satisfaction with the online banking offerings of Punjab National Bank. 70% of respondents said they preferred mobile banking, 20% said they still used online banking, and 10% said they used ATMs for certain types of transactions. A client base that is technologically savvy and actively uses PNB's digital services is reflected in the higher education levels of the respondents, who were primarily between the ages of 25 and 40.

5.2 Analysis of Service Quality Dimensions

Reliability: 82% of consumers said that PNB's virtual banking services were reliable, meaning that their transactions were handled properly and quickly. Customers value error free transactions and constant service uptime, as seen by the substantial link ($r=0.81$) between reliability and total customer happiness. PNB's efforts to maintain high system availability were valued by many respondents, especially during peak hours when there is a significant volume of banking activity.

Responsiveness: Although Punjab National Bank has been successful in providing dependable services, only 60% of respondents were satisfied with the bank's reaction to client questions. Although fast service is vital, it is not the main factor influencing overall satisfaction, according to the study's moderate correlation ($r=0.64$) between responsiveness and customer happiness. Consumers often expressed dissatisfaction with automated systems, especially chatbots, which they believed were insufficient for handling complicated problems.

Assurance: With 85% of respondents expressing trust in the bank's security procedures, PNB received a high assurance rating. Customer trust was often attributed to the implementation of sophisticated security measures, such as secure login procedures and two-factor authentication. PNB's expenditures in cybersecurity are essential to preserving client loyalty in a virtual banking environment, as evidenced by the significant link ($r=0.79$) between assurance and customer happiness.

Empathy: Just 52% of consumers felt that PNB offered individualized attention, making its virtual services the least empathetic. Customer satisfaction and empathy had the poorest association ($r=0.58$), suggesting that although empathy is desired security and dependability are more important. Although the technology was effective, many respondents felt that it lacked the human touch that they would get from in-person contacts at a real location.

Tangibility: 77% of consumers gave PNB's virtual banking services a favorable grade for tangibility, which includes the website and mobile app's usability and aesthetics. The clean interface and user-friendly navigation were appreciated, though some customers suggested improvements in the speed and performance of the mobile app. Customer satisfaction and tangibility had a moderately strong association ($r=0.69$), indicating that although platform appearance is significant, assurance and dependability come first.

Regression Analysis

A regression analysis was applied in order to find the aspects of service quality that most impact customer satisfaction. The results revealed that assurance ($\beta=0.29$) and reliability ($\beta=0.32$) were the most prominent factors influencing satisfaction with PNB's virtual banking services. These

findings demonstrate how vital it is to give precise transactions as well as strict safety protocols. Tangibleness ($\beta=0.21$), responsiveness ($\beta=0.15$), and empathy ($\beta=0.09$) all showed major impacts, although a smaller one on total satisfaction.

6. Discussion

6.1 Impact of Virtual Banking on Service Quality

The study's findings show that Punjab National Bank's online banking services greatly raise the calibre of its services. Excellent reliability and confidence ratings illustrate that customers rely PNB to manage their transactions securely and efficiently. This is in line with studies by Lee and Lin (2005), which highlights how vital reliability and security are to retaining customer satisfaction in online banking contexts. But the survey also identified areas for improvement, especially in terms of responsiveness and empathy, in PNB's virtual services. Although many customers missed the individualized attention they would receive in-branch, they did like the ease of internet banking. This echoes the findings of Zeithaml et al. (2013), which highlight the value customers place on human interaction, even in digital contexts. PNB faces the challenge of incorporating personalized, responsive customer service into its virtual banking platform, potentially through the use of AI and machine learning technologies to simulate human interactions.

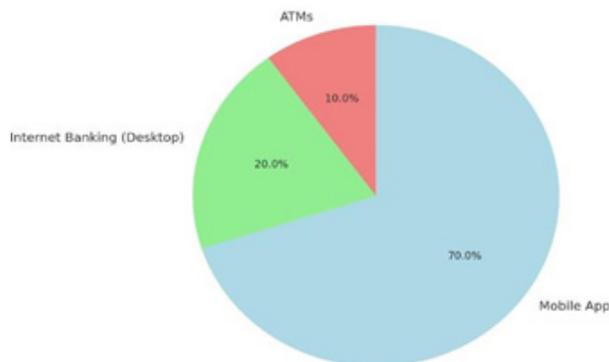


Figure 1 Distribution of Virtual Banking Usage Methods (Pie Chart)

Description: A pie chart displaying the distribution of customers using different virtual banking methods (mobile banking app, internet banking on desktop, and ATMs).

6.2 The Role of Service Quality in Customer Satisfaction

Regression analysis confirmed that service quality is a critical determinant of customer satisfaction in PNB's virtual banking services. While reliability and assurance were the most influential factors, tangibility, responsiveness, and empathy also played important roles. PNB's focus on transaction accuracy and security has paid off, but the bank must also address the emotional and interactive needs of its customers. The relatively low score for empathy suggests that while customers may not expect face-to-face service in virtual banking, they still value a degree of personalization when resolving issues.



Figure 2 Customer Satisfaction with Service Quality Dimensions (Bar Chart)

Description: A bar chart showing customer satisfaction levels for each service quality dimension (reliability, responsiveness, assurance, empathy, and tangibility) based on survey data.

Data	Example Data
X-Axis: Service Quality Dimensions (Reliability, Responsiveness, Assurance, Empathy, Tangibility) Y-Axis: Customer Satisfaction (Percentage of Respondents)	Reliability:82% Responsiveness:60% Assurance: 85% Empathy:52% Tangibility:77%

6.3 Practical Implications for Punjab National Bank Ltd.

The study’s findings have a number of real-world ramifications for PNB Bank Ltd. The bank should first concentrate on upholding the high standard of dependability and security that clients anticipate from its online banking offerings. This entails making significant investments in security measures and making sure that transactions are completed promptly and precisely. The bank should simultaneously endeavor to enhance its responsiveness, especially in the area of client service.

Even while automated technology like chatbots can handle basic questions, customers should still have the option to speak with a human agent when dealing with more complicated problems.

PNB Bank Ltd. should also consider ways to personalize its online banking platform. Two instances of this involve giving customized advice based on customer behavior or using AI to foresee client needs and offer proactive support. Despite its potential high cost, the bank may be able to separate itself from opponents and raise customer satisfaction with these developments.

7. Practical Implications for Punjab National Bank Ltd.

7.1 Enhancing Customer Support

One of the study’s primary results is that customers think PNB’s reaction, especially in customer service, should be strengthened. While chatbots and other automated systems might be helpful for simple inquiries, they struggle to handle complex issues. PNB has to think about using a hybrid approach that combines machine and support from humans. Allowing customers to speak with a live chat representative, for instance, could substantially improve the responsiveness dimension. Additionally, offering human support during periods of high traffic may speed up the process of addressing queries that are more complicated and increase customer satisfaction.

7.2 Investing in Personalization

Low empathy component satisfaction ratings revealed a lack of customization in PNB's online banking offerings. To address this, PNB may employ data analytics and artificial intelligence to offer customized banking experiences. For example, PNB may provide prompt loan offers, customized investment suggestions, or customized financial advice based on historical client transactions. By mimicking the level of attention that customers expect from personal connections, this level of personalization may boost customer satisfaction and retention.

7.3 Maintaining High Levels of Reliability and Security

PNB was praised for its dependability and confidence, especially for ensuring that transactions are secure and accurate. PNB should continue to invest in cybersecurity solutions and ensure that customers are updated on security patches in order to maintain this guarantee. Frequent software updates, clear privacy rules, and robust fraud detection systems will all aid PNB in maintaining customer confidence in its online banking operations.

7.4 Improving the User Experience

Although users generally indicated satisfaction with PNB's online and mobile banking interfaces, a few of respondents suggested that the performance and usefulness of the mobile app be enhanced. PNB should conduct frequent usability tests on its systems to ensure that they remain responsive to customer needs and user-friendly integrating user feedback into app updates. Additionally, PNB may be able to differentiate itself from the competition and increase customer engagement through the introduction of novel features like voice command capabilities or integrated personal money management tools.

8. Conclusion and Recommendations

This study researched the effects of virtual banking services on customer satisfaction and service quality at Punjab National Bank Ltd. (PNB), with a focus on the Ernakulam District. The results show how PNB's online banking offerings have helped improve customer contentment, especially with regard to reliability and assurance. Customers appreciate the efficiency, security, and convenience of PNB's digital platforms. However, the study additionally found areas that required improvement, particularly in responsiveness and empathy. Customers desire faster, more responsive help as well as personalized service from PNB's virtual platforms.

Regression analysis showed that certainty and reliability were the most significant factors influencing consumer happiness, followed by tangibility, responsiveness, and empathy. Correct transactions and robust security are the main concerns of customers measures, despite their appreciation for easy-to-use design and timely service. This implies that PNB needs to manage the human aspects of customer service, which are occasionally lacking from virtual platforms, in addition to upholding its high level of technology dependability.

8.1 Enhance Human Support in Customer Service

Both automated and human customer support ought to be offered by PNB. Chatbots and automated technology can answer routine queries, but more complex issues should be managed by human agents. A live chat function that enables users to speak with real-time agents might significantly enhance customer response and satisfaction.

8.2 Invest in Personalization Features

PNB needs to focus on personalizing its online banking services. This might entail tailored

financial advice or product recommendations based on previous transactions. PNB might increase customer satisfaction and foster more client loyalty by personalizing the customer experience.

8.3 Maintain and Improve Reliability and Security

The bank must continue to make these investments even if PNB is performing well in terms of security and dependability. Reacting quickly to security breaches and communicating openly and honestly with clients about data protection are essential to preserving customer confidence procedures, as well as frequent modifications to security guidelines.

8.4 Improve Mobile App Performance

In response to user feedback, PNB should continue to enhance its mobile banking software. Enhancing the app's speed and including new features, like an intuitive user interface or integrated personal money management, could increase user satisfaction and encourage more frequent use of the web-based platform.

9. Final Thoughts

Because of the digital revolution in financial services, which is being led by institutions like Punjab National Bank Ltd., customers now find banking to be much more efficient and accessible. Nonetheless, banks must not downplay the importance of providing high-quality services if they want to take full advantage of this change in the virtual world. Despite PNB's significant progress, there is still opportunity for improvement, especially in the area of providing more individualized, compassionate, and timely customer service. By addressing these problems, PNB can maintain high customer satisfaction and loyalty while securing its position as a leader in virtual banking.

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