

## Digital Transformation and Customer Satisfaction in New Generation Private Banks in India: The Mediating Role of Operational Efficiency.

Arpan Patel<sup>1</sup>, Dr. Ritesh H. Patel<sup>2</sup>

<sup>1</sup>Research Scholar, Faculty of Management Studies, Parul University, Gujarat

Arpanpatel31794@gmail.com

<sup>2</sup>Associate Professor, Faculty of Commerce, Parul University, Gujarat

### ABSTRACT

The present research paper examines the relationship between digital transformation and customer satisfaction in Indian banks, with a specific focus on the mediating role of operational efficiency. The main objective is to understand whether digital transformation directly improves customer satisfaction and whether this effect is strengthened through improvements in internal banking processes. Based on this, two hypotheses were tested: first, that digital transformation has a significant positive impact on customer satisfaction, and second, that operational efficiency mediates this relationship. The research study adopts a quantitative and explanatory research design using primary data collected from 300 respondents across selected Indian banks. Digital transformation (DTI\_avg) is treated as the independent variable, customer satisfaction (CS\_Dependent) as the dependent variable, and operational efficiency (OE\_Mediator) as the mediating variable. Statistical tools such as descriptive analysis, cross-tabulation, ANOVA, regression analysis, and mediation testing were applied to generate empirical evidence. The results indicate that digital transformation has a strong and statistically significant positive effect on customer satisfaction ( $B = 0.595, p < 0.001$ ), explaining 26.5% of the variation in the dependent variable. Further analysis shows that digital transformation also significantly improves operational efficiency ( $B = 0.573, p < 0.001$ ). When operational efficiency is included in the model, its effect on customer satisfaction is also positive and significant ( $B = 0.174, p < 0.001$ ), while the direct effect of digital transformation decreases but remains significant ( $B = 0.496, p < 0.001$ ). The Sobel test confirms a significant indirect effect ( $Z = 3.693, p < 0.001$ ), indicating partial mediation. Final findings observed that digital transformation not only directly enhances customer satisfaction but also improves it indirectly by strengthening operational efficiency. The study concludes that banks can achieve better customer outcomes when digital initiatives are effectively integrated with efficient operational practices. Overall, digital transformation, supported by operational improvements, plays a critical role in enhancing customer satisfaction in the banking sector.

**Keywords:** : Digital Transformation, Customer Satisfaction, New Generation, Private Banks, India, Mediating Role, Operational Efficiency.

### INTRODUCTION:

The banking sector has undergone significant changes over the past two decades, largely driven by rapid advancements in digital technologies in India. Banks are increasingly adopting digital tools such as mobile banking, internet banking, automated services, and data-driven decision systems to improve their service delivery and remain competitive in a dynamic financial environment. This shift toward digital transformation is not only reshaping internal operations but also redefining how banks interact with their customers.

The digital transformation in banking refers to the integration of technology into all areas of banking activities, resulting in improved efficiency, faster service delivery, and enhanced customer experience. Earlier, banking services were largely branch-dependent and time-consuming. However, with the introduction of digital platforms, customers can now perform transactions conveniently at any time and from any location. This

transition has changed customer expectations, making convenience, speed, and reliability essential components of banking services (Verhoef:2021).

The customer satisfaction has become a key performance indicator for banks, as satisfied customers are more likely to remain loyal and engage more frequently with banking services. Digital channels play an important role in shaping customer perceptions by offering quick responses, personalized services, and seamless transaction experiences. Studies have shown that improved digital services contribute positively to customer satisfaction by reducing waiting time and increasing accessibility (Jun and Palacios:2016). However, the relationship between digital transformation and customer satisfaction is not always direct and may depend on how effectively banks manage their internal operations.

Operational efficiency is an important factor that links digital transformation with customer outcomes. When banks adopt digital systems, they often streamline processes, reduce manual errors, and lower operational

costs. These improvements enable banks to deliver faster and more reliable services, which in turn enhances customer satisfaction. Efficient operations also support better decision-making and resource allocation within banks (Davenport:2018). Therefore, operational efficiency can be understood as a mediating mechanism through which digital transformation influences customer satisfaction.

In the Indian context, both public and private sector banks have been actively investing in digital infrastructure to improve their performance and service quality. While earlier studies have examined digital banking and customer satisfaction separately, there is limited research that explains how operational efficiency acts as a connecting factor between the two. Understanding this relationship is important for banks aiming to maximize the benefits of digital transformation.

### Research Objectives:

To examine the impact of digital transformation on customer satisfaction in Indian banks.

To analyse the mediating role of operational efficiency in the relationship between digital transformation and customer satisfaction.

### Hypothesis of the Study:

**H1:**Digital transformation has a significant positive effect on customer satisfaction in Indian banks.

**H2:**Operational efficiency significantly mediates the relationship between digital transformation and customer satisfaction in Indian banks.

## 4. Literature Reviews:

(Verhoef :2021) examined the broader concept of digital transformation across service industries, including banking, with a focus on how digital technologies reshape customer interactions and firm performance. The study mainly used a conceptual and analytical approach supported by secondary data from multiple industries. It highlighted that digital transformation improves service delivery by increasing speed, accessibility, and personalization. The authors found that organizations that effectively integrate digital tools into their operations are better positioned to enhance customer experience. In the banking context, this suggests that digital initiatives can significantly influence customer satisfaction, but the outcomes depend on how well these technologies are aligned with service processes.

(Jun and Palacios:2016) focused on the determinants of customer satisfaction in digital banking environments, particularly in online and internet banking services. The study applied empirical analysis using survey data and statistical techniques such as regression to identify key

influencing factors. It found that service quality dimensions such as reliability, ease of use, responsiveness, and security play a major role in shaping customer satisfaction. The study also showed that customers value convenience and time-saving features provided by digital platforms. However, it emphasized that technological availability alone is not sufficient, and banks must ensure consistent service performance to maintain customer satisfaction.

(Davenport:2018) explored the role of digital technologies in improving organizational performance, with a strong focus on operational efficiency. The study used case-based analysis and secondary data to understand how firms adopt digital systems to streamline their processes. It found that digital transformation helps reduce operational costs, minimize errors, and improve decision-making efficiency. These improvements indirectly enhance customer-related outcomes by enabling faster and more reliable service delivery. In the banking sector, this indicates that operational efficiency acts as an important link between digital transformation and customer satisfaction, as efficient processes lead to better service experiences.

## 5. Methodology & Tools:

The present research study employed a quantitative, explanatory research design to examine the relationship among digital transformation, operational efficiency, and customer satisfaction in Indian banks. The analysis is based on a structured dataset containing 300 observations drawn from the Excel file provided for this study. Since the objective is to test both direct and mediating relationships, the design is suitable for statistical analysis using descriptive and inferential techniques.

The present study includes respondents associated with Indian banks such as Axis Bank, HDFC Bank, ICICI Bank, State Bank of India, Kotak Bank, and Equitas Bank. All banks available in the dataset were included in the analysis. Thus, the study follows a full-sample approach within the provided data rather than restricting the analysis to a smaller banking category. Here uses three main constructs. Digital Transformation is treated as the independent variable and is represented through the composite indicator DTI\_avg. Customer Satisfaction is the dependent variable and is represented through the composite score CS\_Dependent, which reflects satisfaction, retention, prompt service, and engagement. Operational Efficiency is used as the mediating variable and is represented through OE\_Mediator, which captures cost reduction and process streamlining. Under the statistical analysis of the present research study, descriptive statistics, cross tab, ANOVA and regression analysis has been applied for the achieve the objectives and hypothesis as scientific evidence during this session.

## 6. Results & Discussion: (A: Descriptive Section)

The descriptive statistics **Table:1** represents of the three main variables used in the study, namely digital transformation (DTI\_avg), operational efficiency (OE\_Mediator), and customer satisfaction

(CS\_Dependent), based on a sample of 300 observations. The table provides information on the mean, standard deviation, minimum, and maximum values, which helps in understanding both the central tendency and variability of the data.

**Table:1 Descriptive Summary**

Variable	N	Mean	Std. Dev.	Min	Max
DTI_avg	300	3.845	0.423	2.714	4.714
OE_Mediator	300	4.073	0.636	2.5	5
CS_Dependent	300	3.963	0.489	2.75	5

*Source: Data Analysis by the author on the Collected Primary Data*

The digital transformation shows a fairly high average (3.845) with low variation, meaning most respondents consistently perceive strong digital adoption across banks. Operational efficiency has the highest mean (4.073), indicating that respondents clearly feel digital initiatives are improving internal processes, though opinions vary slightly more. Further, customer satisfaction is also high (3.963) with moderate consistency, suggesting generally positive customer experiences. Overall, the pattern shows that better digital transformation is closely associated with improved efficiency and satisfaction, supporting the study's core relationship.

Here, **Table:2 digital transformation level**, showing that moderate digital transformation is the most common category, accounting for 46.7% of the total sample (140 out of 300), followed by high digital transformation at 31.3% and low digital transformation at 22.0%. So, this means most respondents fall in the middle to higher range, suggesting that digital transformation is fairly well established across the banks studied.

**Table: 2 Bank-Wise Distribution of Digital Transformation Level**

Bank	Low	Moderate	High	Total
Axis Bank	37	64	57	158
Equitas Bank	2	6	1	9
HDFC Bank	8	26	15	49
ICICI Bank	10	26	11	47
Kotak Bank	6	8	3	17
State Bank of India	3	10	7	20
<b>Total</b>	<b>66</b>	<b>140</b>	<b>94</b>	<b>300</b>

*Source: Data Analysis by the author on the Collected Primary Data*

In comparative view, the combined share of moderate and high categories is 78.0%, which is much larger than the low category. This indicates that digital practices are not at an early stage in the sample banks, but are already

present at a meaningful level. Overall, the table suggests a generally positive digital transformation profile across the banking sector covered in the study.

The **Table: 3** shows the overall distribution of customer satisfaction levels across the sample. Out of 300 respondents, high customer satisfaction has the largest share (117 responses, 39.0%), followed by moderate satisfaction (101 responses, 33.7%), while low satisfaction is the lowest (82 responses, 27.3%). Comparatively, the combined percentage of moderate and high satisfaction is 72.7%, which is much higher than low satisfaction. This indicates that the majority of customers are either moderately or highly satisfied with banking services.

**Table: 3 Bank-Wise Distribution of Digital Transformation Level**

Digital Transformation Level	Low CS	Moderate CS	High CS
Low	31	27	8
Moderate	46	47	47
High	5	27	62
<b>Total</b>	<b>82</b>	<b>101</b>	<b>117</b>

*Source: Data Analysis by the author on the Collected Primary Data*

The higher proportion of high satisfaction suggests that banking services are generally meeting or exceeding customer expectations. At the same time, the presence of nearly one-fourth of respondents in the low category (27.3%) shows that there is still scope for improvement. Overall, here indicating a positive satisfaction trend, but with some variation that banks need to address for better service consistency.

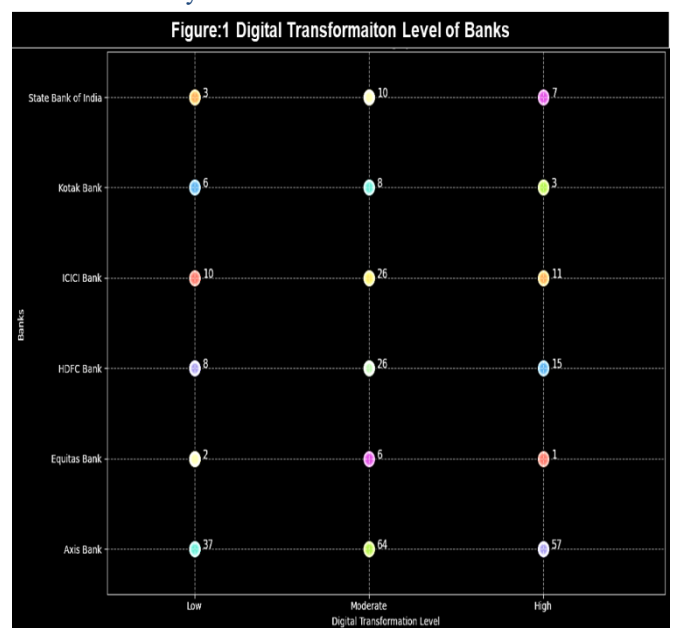
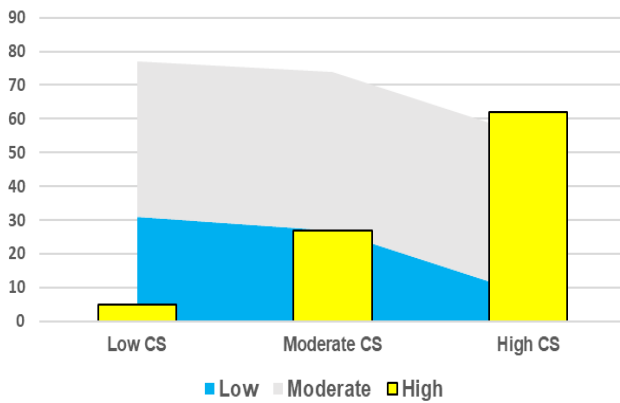


Figure:2 Digital Transformation of Banks



**(B: Empirical Section)**

H1: Digital transformation has a significant positive effect on customer satisfaction in Indian banks.

Table: 4 Regression Result

Variable	Coefficient (B)	Standard Error	t-value	p-value
Constant	1.678	0.215	7.804	< 0.001
Digital Transformation (DTI_avg)	0.595	0.057	10.366	< 0.001

Here, the regression results indicating to digital transformation has a positive and statistically significant effect on customer satisfaction (**B = 0.595, p < 0.001**). The model explains 26.5% of the variation in customer satisfaction (**R<sup>2</sup> = 0.265**). The F-statistic is also significant, indicating that the overall model is a good fit. Therefore, the results evidence of acceptance of H1.

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
0.515	0.265	0.263	0.42

Table: 5 ANOVA Supportive Result

Source	Sum of Squares	df	Mean Square	F	p-value
Regression	18.742	1	18.742	107.45	< 0.001
Residual	51.98	298	0.174		
Total	70.722	299			

The ANOVA results show that the regression model is statistically significant. The F-value of 107.45 with a p-value less than 0.001 indicates that digital transformation has a meaningful effect on customer satisfaction. Since the p-value is much lower than 0.05, the model is highly significant. The regression sum of squares (18.742) explains a considerable portion of the total variation in customer satisfaction, while the residual value (51.98) shows the unexplained variation. This means that

although other factors exist, digital transformation contributes significantly to explaining customer satisfaction. Finally, the ANOVA results confirm that the model is valid and supports the hypothesis that digital transformation influences customer satisfaction in Indian banks.

**Model 1: Effect of Digital Transformation on Customer Satisfaction**

Variable	Coefficient (B)	p-value
DTI_avg → CS_Dependent	0.595	< 0.001

**Model 2: Effect of Digital Transformation on Operational Efficiency**

Variable	Coefficient (B)	p-value
DTI_avg → OE_Mediator	0.573	< 0.001

**Model 3: Effect of Digital Transformation and Operational Efficiency on Customer Satisfaction**

Variable	Coefficient (B)	p-value
DTI_avg → CS_Dependent	0.496	< 0.001
OE_Mediator → CS_Dependent	0.174	< 0.001

The Model results show that digital transformation significantly affects both operational efficiency and customer satisfaction. When operational efficiency is included in the model, the effect of digital transformation decreases from 0.595 to 0.496 but remains significant. At the same time, operational efficiency also shows a significant positive effect on customer satisfaction.

**Sobel Test for Indirect Effect**

Measure	Value
Indirect Effect (a × b)	0.099
Sobel Z-value	3.693
p-value	0.00022

The Sobel test confirms that the indirect effect is statistically significant. This indicates that operational efficiency partially mediates the relationship between digital transformation and customer satisfaction. Therefore, here H2 alternative hypothesis is accepted with cross evidence.

**7. Conclusion:**

The digital transformation has a strong and positive impact on customer satisfaction. This indicates that improvements in digital services such as faster transactions, better accessibility, and enhanced convenience are directly contributing to better customer experiences. The statistical results, including a significant

coefficient and high t-value, confirm that this relationship is not by chance but reflects a real pattern within the banking sector. Further, the study highlights the importance of operational efficiency as a key mechanism. Digital transformation not only affects customers directly but also improves internal processes such as cost reduction and service delivery speed. These operational improvements, in turn, enhance customer satisfaction. The mediation results clearly show that when operational efficiency is considered, the direct effect of digital transformation reduces but remains significant, indicating partial mediation. This means that both direct and indirect pathways are important. In the cross-evidence, the Sobel test further strengthens this conclusion by confirming that the indirect effect is statistically significant. In practical terms, this suggests that banks cannot rely only on introducing digital technologies. The real benefits emerge when these technologies are effectively integrated into operational processes.

In aggregate, the study provides evidence that digital transformation is a critical driver of both efficiency and customer satisfaction in Indian banks. However, the findings also suggest that the quality of implementation matters as much as the adoption itself. Banks that focus on improving operational efficiency alongside digital initiatives are more likely to achieve higher customer satisfaction. In conclusion, the research supports that digital transformation, supported by efficient operations, plays a central role in shaping positive customer outcomes

in the banking sector. Thus it confirming to digital transformation, along with efficient operations, helps improve customer satisfaction in banks.

## REFERENCES

1. Davenport, T. H. (2018). *The AI advantage: How to put the artificial intelligence revolution to work*. MIT Press.
2. Jun, M., & Palacios, S. (2016). Examining the key dimensions of mobile banking service quality: An exploratory study. *International Journal of Bank Marketing*, 34(3), 307–326.
3. Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Dong, J. Q., Fabian, N., & Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of Business Research*, 122, 889–901.
4. Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144.
5. Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2018). *Services marketing: Integrating customer focus across the firm* (7th ed.). McGraw-Hill.
6. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

..