

# Key Factors Influencing E-banking in India: A Comparative Analysis of Public and Private Sector Banks

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**Abstract:** The fast expansion of fintech and the widespread use of Smartphone have accelerated digital banking adoption in India, offering users enhanced convenience and transforming the nation's financial landscape. This study analyses factors affecting the adoption of E-banking services across selected public and private sector banks in India's Saurashtra region. An organised questionnaire was given to account holders from two private sector banks (ICICI and HDFC) and two public sector banks (SBI and BOI), for 160 participants. Our analysis identified that usability, security, and technological sophistication are significant drivers of customer satisfaction, with factor analysis confirming these components' substantial influence. Findings indicate no notable differences in customer perception based on gender or location, suggesting a broad-based acceptance of E-banking services across diverse demographics.

**Key Words:** E-banking, Tech-savvy, Digital infrastructure, Seamless digital service delivery, Fintech, Digital banking adoption

## I. INTRODUCTION

The banking sector stands at the forefront of India's infrastructure in terms of the economy; it provides economic stability, maximizes inclusiveness, and promotes growth. Economic growth, regulatory policy, and speedy technological assimilation have all brought a sea of change to this sector over the past few decades. In this recent past, digital innovations came forward as the biggest facilitators, changing the approach to banking transactions, particularly through electronic banking. The change from traditional banking practices to innovative, customer-centric methods is in alignment with the Indian government's goal of a cashless economy, as exemplified by programs such as Digital India. Scholars like Kaur and Rajneesh (2014) contribute to the argument that digital

technology has significantly improved service delivery while increasing access, efficiency, and inclusivity in banking.

E-banking is a very broad term encompassing mobile banking applications, internet banking, ATMs, and other advanced systems like the Unified Payments Interface. These services have revolutionized the consumer experience through smooth, real-time transactions and removed geographical and temporal barriers. According to Jain and Ghosh in 2019, the electronic banking service offered not only develops client convenience, but also a reduction in expenses for banks would help them increase resource management skilfully while going towards environmental sustenance.

The importance of e-banking for financial inclusion cannot be overemphasised. Researchers such as Sharma and Singh, 2020 point to the fact that through digital banking technology, rural and semi-urban communities have closed the gap once restrained to access formal banking. In this aspect, the democratisation of bank accessibility makes it an ideal tool in India's pursuit of inclusive economic growth. Das and Jagtap (2021) also exhibit that the success of e-banking is heavily reliant on the removal of infrastructure and literacy challenges in these areas, specifically for banks of public sector that cater to a greater proportion of disadvantaged people.

Though private sector banks are implementing cutting-edge technologies to deliver personalized and seamless services, the public sector banks sometimes face issues due to obsolete infrastructure and a delayed acceptance of innovations. Bhattacharya and Mitra (2018) state that private banks use sophisticated analytics, artificial intelligence, and user-friendly

platforms to stay ahead of the game and attract tech-savvy consumers. According to Singh and Mehta, 2022, public banks have to address financial inclusion at their core by being innovative in ways that still reach a heterogeneous clientele.

The comparative dynamics of public and private sector banks' e-banking adoption provides a detailed understanding of the problems and possibilities that each confront. While public sector banks play a vital role in fostering financial inclusion, their delayed adoption of digital advances and technical restrictions frequently limit their effectiveness. Private sector banks are agile and client-centric and hence thrive on the utilisation of technology to enhance customer happiness and operational efficiency.

The research intended to investigate the primary forces driving the adoption of e-banking services in India by comparing services offered by public and private sector banks. This will shine light onto specific dynamics of e-banking in India. Technology breakthroughs, client preference, operational concerns, regulatory regimes, and issues related to security are some important issues that form part of research on e-banking in the country. As noted by Bansal and Gupta (2023), identifying these characteristics is critical for both policymakers and banking professionals in developing strategies to improve the overall efficacy and inclusivity of digital banking services.

#### Technological Change in Banking: Role of E-banking

Technical progress has brought many modifications in the Indian financial system. Of all such improvements, one is e-banking or electronic banking, which has brought about a new change in the relationship between customers and banks, with its introduction changing the entire customer-bank experience to streamlined, efficient, and easy banking. At its core, e-banking is the provision of financial services through electronic platforms, which may include cash transfers, balance enquiries, online bill payments, and much more. It provides the consumer with a 24-hour access to his accounts, freeing him from geographical and time barriers that earlier hobbled traditional banking systems.

E-banking technologies such as mobile banking apps, internet banking, automated teller machines (ATMs), and the Unified Payments Interface (UPI) have revolutionized the way banks offer services. These technologies enable clients to operate their accounts with unprecedented ease. According to Kaur and Rajneesh (2014), These advances have led to a paradigm shift in service delivery, making it easier for clients to execute transactions without having to physically visit branches.

E-banking's impact transcends metropolitan regions. It has been an effective instrument in increasing financial inclusion, particularly in rural and semi-urban areas. People residing in these areas were unable to obtain financial services due to lack of physical infrastructure and inaccessibility. With mobile and internet banking coming into existence, these communities now get to access financial services through participation in the formal financial system. The whole process has democratized access to banking, thus bridging the urban-rural divide. Secondly, it adheres to the India policy of inclusive economic growth that encourages provision and empowerment of different sections of people in the socio-economic scale.

The digital revolution through e-banking has also brought operational efficiency in the financial sector. The automation and digitization have streamlined the normal processes, reduced human caused mistakes, and helped allocate resources efficiently. The banks are now in a position to conduct real-time transactions, process massive data with high efficiency, and deliver tailored services depending on the specific client requirements. Operational efficiency has increased not only the delight of clients but also the capability of the banks to reduce cost of operations and enhance profit margins.

#### II. ADVANTAGES OF E-BANKING: REVOLUTIONIZING THE CUSTOMER EXPERIENCE

E-banking has brought forth a myriad of benefits for users and financial institutions alike, transforming the way banking services are accessed and delivered.

##### 1. Convenience and accessibility

For customers, e-banking offers unparalleled convenience. Transactions can be performed at any time and from anywhere, eliminating the need to visit physical branches. This is especially handy for the peoples who have busy schedules or reside far way. They even use mobile banking applications and internet portals to view balances, make transfer payments, pay bills, or even apply for loans. Mobile apps and online services are accessible to users around the clock and allow them to manage their funds any time.

For example, UPI has simplified payment by allowing consumers to easily transfer money using mobile devices. This innovation has facilitated cashless transactions and increased digital payments in India. The capacity to conduct transactions safely and fast has made e-banking a necessity technology for modern customers.

## 2. Reduced operational costs

E-banking is the most cost-efficient for banks. Banks can minimize their operating expenses significantly by e-enabling the routine activities and by reducing dependence on physical branch networks. Automated systems eliminate the necessity of manual involvement in activities such as account management and transaction processing, which means saving on cost. Additionally, the lesser use of paper-based documentation also complies with ecological objectives and decreases overhead costs.

As Jain and Ghosh (2019) argued, the savings from the cost that e-banking accrues would result in better resource reallocation for like innovation and improvement of customer service. This has been especially helpful to private-sector banks which use digital technology to preserve a competitive advantage and recruit tech-savvy consumers.

## 3. Financial Inclusion & Outreach

E-banking has played a critical role in spreading financial services to underprivileged communities. E-banking offers a platform to the users of the electronic medium, which has helped fill the void left by the scarcity of few physical branches in the rural and semiurban regions. With the help of mobile banking applications and online banking, people in these

locations could save money and acquire credit and enter the formal economy.

Thus, the government's programs, such as the Pradhan Mantri Jan Dhan Yojana, have paved the way for financial inclusion by bringing digital banking into the lives of millions of unbanked people. Therefore, providing e-banking services in several regional languages has further helped the platform reach a wider audience.

## 4. Enhanced customer insights and personalisation.

E-banking allows the banks to collect and analyze massive volumes of client data, since it is digital in nature. This data-driven approach helps banks understand the customers' preferences, spending habits, and financial aspirations. Banks may offer personalised services that include loan products tailored to a customer's specific needs, investment suggestions, and targeted marketing efforts by integrating analytics and artificial intelligence.

For example, private-sector banks frequently employ predictive analytics to anticipate client demands and provide proactive solutions. This level of personalisation increases client pleasure and loyalty, making e-banking an important part of modern customer relationship management.

## 5. Improved security and fraud prevention.

E-banking services use advanced security measures to ensure that consumers' information is kept safe from fraudulent activities. A few of the steps used in order to maintain digital transaction safety are multi-factor authentication, encryption, and biometric identification. Moreover, banks make sure to increase awareness of online safety through their clients so they can be comfortable while accessing their e-banking services. Although security threats persist, innovation in cybersecurity solutions helps mitigate threats and enhance consumer confidence.

## 6. Sustainability and Environmental Benefits

E-banking promotes environmental sustainability by reducing the demand on paper transactions. Online statements, digital receipts, and e-signatures reduce the use of paper, in line with global efforts to fight environmental degradation. According to Jain and

Ghosh (2019), this step not only promotes eco-friendly activities but also attracts environmentally conscious clients, thereby enhancing banks' ESG ratings.

E-banking reduces carbon footprint through reductions of physical branch visits and cash transit by encouraging digital transactions, thereby staying in step with India's commitment to sustainable development and placing the banking industry at a critical forefront of conserving the environment.

#### 7. Empowerment via Financial Literacy.

The development of e-banking indirectly increases financial knowledge among users. Customers that use digital platforms learn how to manage their finances, comprehend financial products, and make educated decisions. Banks' educational activities raise knowledge of the benefits and functionality of e-banking, encouraging a culture of financial empowerment.

### III. LITERATURE REVIEW

Savaliya Sweta and Dr. Khasgivala Vishal (2024) provide an in-depth review of the evolving landscape of e-banking, examining trends, ongoing challenges, and future directions. Their work synthesizes various studies to present a brief overview of the E-banking sector's current status and anticipated advancements, providing a foundation for further research to improve the security and efficiency of E-banking services.

Prakash, M. (2023) The survey evaluates consumer satisfaction with the E Banking services by Axis Bank. It utilizes a structured questionnaire to gather data from e-banking customers, focusing on factors such as system ease of use, security, privacy, and system speed. The results indicate that system reliability, ease of use, privacy, and security has a favourable influence on consumer satisfaction with system speed being the least rated factor. The study suggests that Axis Bank should enhance the speed of its e-banking services while continuing to prioritize privacy and security to improve customer satisfaction. The research also identifies the strengths and weaknesses of the e-banking services, offering useful ideas that can refine the bank's offerings and maintain customer loyalty.

Moli Tyagi, (2022) conducted a comparative analysis of customer perceptions toward E-banking at SBI and ICICI Bank, evaluating the variables influencing satisfaction of consumers and future growth potential. Using a formal questionnaire with 150 respondents from SBI and ICICI, Tyagi concluded that SBI offers the best E-banking services, largely due to superior customer security and support.

Dr. Arti Singh, & Dr. Sarita Rana, (2022) explored the quality of digital banking services between ICICI Bank and SBI in Bangalore, focusing on critical variables such as system availability, efficiency, and privacy. Their findings reveals that SBI excelled in efficiency and responsiveness, while ICICI was stronger in privacy and user experience interface, implying that different banks may prioritize various aspects of customer satisfaction in digital banking.

Vikas Chauhan (2022) The research points out the importance and relevance of newly added variables in determining customers' desire to use e-banking services. With the inclusion of new criteria, the study unfolds the reasons behind the reasons that drive customers to join e-banking. A variety of factors, which include technological features, convenience, and trust, can significantly affect client adoption behavior. The results highlight the dynamic nature of e-banking adoption, that means both traditional and emergent criteria need to be considered in the study of customer intentions to use e-banking services.

Verma, P. K., & Tanwar, A. (2022) The paper analyzes the ways in which COVID-19 impacted e-banking in India, assessing its adoption before, during, and after the pandemic. Based on 400 completed questionnaires and secondary sources such as RBI data and journals, it shows that e-banking usage increased during the epidemic due to its safety and convenience. E-banking minimized physical touch, improved service efficiency, and increased customer loyalty. However, the study reveals deficiencies in technical literacy and awareness of end users. It ends with ideas on increasing trust, promoting the benefits of e-banking through the media, and creating campaigns for awareness purposes to increase widespread use in the changed financial scene.

Dhanya B K, & Dr. V .P Velmurugan, (2021) examined demographic factors' impact on E-banking

service satisfaction, trust and quality in Kerala. Analyzing responses from 290 customers at Punjab National Bank, Indian Overseas Bank and Canara Bank, the study revealed that educated, high-income users with extensive online banking experience held more favorable views, though variables such as age and gender did not have a significant impact on trust or perceived efficiency.

Dr. Sowmya Praveen K, Dr. C.K. Hebbar (2021) examined customer perceptions of E-banking services, revealed that public sector banks provide lower service quality than private banks. The study argues that public and private banks both should improve customer service quality at reasonable costs, emphasizing that satisfaction of the customers is essential for sustained market relevance.

Mr. Rahulkumar, (2021) did a comparative review of the E-banking offered by few public and private sector banks of Gujarat. The primary data required for this study must look at how customers in the North Gujarat Region perceive the E-banking services offered by a few public and private banks. The analysis of consumer perception has led to significant advancements in this industry. Customers prefer private sector banks' E-banking services over those of public sector banks, according to the research report.

Smriti, A., & Kumar, R. (2021) The study is based on secondary data from academic and online sources, which it investigates the current state, obstacles, and potential for e-banking in India. It investigates digital banking services such as fund transfers, ATMs, mobile banking, and UPI, stressing their importance in consumer satisfaction and loyalty. The research focuses on technology improvements, discrepancies between private and public sector banks, and concerns like cybersecurity threats and digital literacy gaps. The findings indicate that e-banking is disrupting the traditional banking system of India, and it will dominate the future banking practices. This fits well with the research topic.

Prof. Madhumathi, & Dr. C Nagadeepa, (2020) studied to find out E-banking acceptance on demographic variations among rural customers with respect to Tumkur Taluk. The study focuses on the impact of demographic characteristics such as gender, age, and occupation of the customers on e-banking

services of Tumkur district, Bangalore. The study employed structured questionnaires to collect primary data. The questions on the questionnaire were developed on a 5-point Likert scale. A total of 100 questionnaires were collected. The findings of the study revealed that demographic factors like gender, age and occupation of the customers have significant difference while accepting the e-banking services. Most of the services were accepted by the young group people. The people who are home are comfortable with the traditional banking system. The research suggests that more awareness needs to be created among the aged people and should gain the trust and belief among all types of customers.

Manpreet Singh, Neha (2020) The study looks into consumer satisfaction with E-banking services offered by the public and private sector banks, with an emphasis on effect of gender and age on the service quality. Using a standardized questionnaire, data from 236 respondents (excluding Jalandhar City) were analysed using the statistics and an independent t-test in SPSS. The results, significant at the 5% level, support the null hypothesis, indicating that factors like usability, convenience, time savings, security, accuracy, reliability, response, processing speed, updates, and overall efficiency are not influenced by age, gender, or bank preference, highlighting a consistent satisfaction level across demographics.

Rajendran, P., & Sudha, D. B. (2019) has conducted any research on the five-year analysis, which ran from 2015 to 2019, utilising metrics such as proprietary ratio, ratio analysis, fixed asset ratio, and the cash position to draw conclusions. The primary purpose of the research was to examine the bank's solvency and liquidity levels and spot any changing patterns. The study concluded that HDFC Bank had a good and strong financial performance over the study period after analysing the aforementioned ratios.

A. Irudayaraj (2019) aims to evaluate the efficiency of E-banking and traditional banking, discover which services are offered on the Bank Sectors website, and investigate the reasons behind bank switching. Customers can benefit from bankers' instruction and inducement to utilize E-banking services, since it has been discovered that their knowledge of these services is low. There are more private sector banks working

on it than public sector banks. According to the data, majority of bankers consider that E-banking services have enhanced the overall bank performance in both public and private sector banks.

Sangeeta Arora (2018) The study aimed at establishing the characteristics that contribute to customers' adoption of e-banking services. It established that women, better educated customers, more youthful customers, and customers with a middle-class origin were the most likely adopters of e-banking services. Among the 11 perceptual traits tested, six had a significant positive correlation with e-banking usage. These included factors such as information, performance, self-interest, service quality, satisfaction, and experience.

Miss. M.Vairavi, (2017) investigated the impact of security concerns on customer satisfaction in e-banking, noting that fears around data breaches and financial loss can deter users. The study emphasizes the importance of robust security measures and diversified service offerings across age groups to enhance user confidence and satisfaction.

Prof. (Dr.) Dinesh C. Agrawal, (2017) The survey states that the majority of individual hold account with private sector banks. Account holders with public banks face more challenges than those with private banks. According to the study's findings, most individuals are happy with the basic services that private sector banks offer.

#### Research Justification:

E-banking offers significant advantages over traditional banking methods. It enables banks to expand their customer base, reduce costs, customize services at scale, innovate products, and improve marketing and communication efforts. E-banking also allows banks to enter non-core markets and provide services that are accessible anytime and from any location. As technology advances, E-banking is projected to become a primary banking option for many customers, reducing the need for physical branch visits and enhancing convenience.

This research fills a critical gap by providing actionable insights into E-banking dynamics, helping banks to better cater to their customers and improve

their digital banking offerings. The primary goal of the study is to evaluate various factors influencing the adoption and effectiveness of E-banking services in public and private sector banks of India in Saurashtra region.

#### IV. OBJECTIVES OF THE STUDY

1. To examine the factors influencing the utilisation of E-banking services.
2. To study effect of gender on utilising E-banking services provided by the selected Public and private sector banks of India.
3. To assess the impact of demographic variables of the respondents on adoption of E-banking services.

#### V. RESEARCH METHODOLOGY

##### Research Design:

This research used a descriptive study which suited the exploration of in-depth consumer feedback on E-banking services. The descriptive method made it possible to have an investigation about customer satisfaction and things that make up elements influencing E-banking service adoption. It was appropriate to get comprehensive data to further explore client attitudes and perspectives for insights into E-banking usage details.

**Data Collection Method:** The data were collected from both primary and secondary sources, thus gaining a holistic understanding of E-banking dynamics in the Saurashtra area.

##### 1. Primary Data:

- A systematic questionnaire was designed to get firsthand knowledge from respondents. This featured demographic questions as well as a portion where users may rate several criteria impacting E-banking adoption, such as usability, convenience, security, and technological simplicity.
- The questionnaire used a five-point Likert scale, which allowed respondents to score the elements based on their own experiences.

- The questionnaire was distributed online using Google Forms, and a convenience sample approach was utilised to reach out to E-banking clients in Saurashtra. This elicited 160 answers, giving useful data for the study.
- The questionnaire was sent online via Google Forms to the E Banking users in Saurashtra region using convenient sampling method.. A total of and responses were received from 160 participants.

## 2. Secondary Data:

The Secondary data were gathered from books, Industry reports, academic journals and online database to help contextualise and validate the study's conclusion. These sources provided insights on E-Banking trends and Challenges at both national and global levels.

This combined strategy of collecting primary and secondary data guaranteed that the study was thorough and rigorous in its examination of the factors driving E-banking uptake in the region.

## Hypothesis

- $H_01$ : There is no significant difference in efficiency scores between male and female respondents.
- $H_1$ : There is a significant difference in efficiency scores between male and female respondents.
- $H_02$ : There is no significant difference in efficiency scores between urban and semi-urban respondents.
- $H_2$ : There is a significant difference in efficiency scores between urban and semi-urban respondents.
- $H_03$ : There is no significant difference in usability scores between male and female respondents.
- $H_3$ : There is a significant difference in usability scores between male and female respondents.
- $H_04$ : There is no significant difference in usability scores between urban and semi-urban respondents.
- $H_4$ : There is a significant difference in usability scores between urban and semi-urban respondents.

## •Data Processing:

The data from the 160 questionnaires were carefully edited, coded, and analyzed using SPSS software (version 22). The analysis included both simple percentage analysis and t-tests to evaluate the significance of the results and gain insights into user perceptions of E-banking services.

Table 1: Demographic Profile of Respondents (n=160)

Sr. No.	Variable	Category	Frequency	Percentage
1	Gender	Female	83	51.875
		Male	77	48.125
2	Age	18–25 years	93	58.125
		26–35 years	44	27.5
		36–45 years	17	10.625
		Above 45 years	6	3.75
3	Residential Area	Urban	134	83.75
		Semi Urban	26	16.25
4	Education	Less than Higher Secondary H.Sc	0	0
		Higher Secondary H.Sc/Diploma	4	2.5
		Graduate	43	26.875
		Post Graduate	95	59.375
		Professional/Technical	6	3.75
		Ph.D.	12	7.5
5	Occupation	Private Job	70	43.75

		Government Job	8	5
		Business	26	16.25
		Professional	5	3.125
		Student	38	23.75
		Other	13	8.125
6	Annual Income	Up to 3 Lakhs	90	56.25
		3 Lakhs to 5 Lakhs	45	28.125
		5 Lakhs to 10 Lakhs	17	10.625
		Above 10 Lakhs	8	5
7	Name of Bank	HDFC	52	32.5
		ICICI	13	8.125
		SBI	67	41.875
		BOI	28	17.5
8	Type of account	Saving Account	150	93.75
		Current Account	10	6.25

The demographic analysis (Table 1) shows a near-equal distribution of male (48.12%) and female (51.87%) respondents, indicating that E-banking services appeal to both genders almost equally. Age distribution reveals a majority of users are between 18–25 years (58.13%), followed by those aged 26–35 years (27.5%). This shows that younger people are more actively interested and involved in E-Banking since they are more familiar with digital technologies.

In terms of residential locations, the vast majority

(83.75%) live in cities, with just a minor fraction (16.25%) living in semi-urban regions.

State Bank of India (SBI) holds the largest share among banks listed (41.87%), with HDFC following at 32.5%. Among the account types, savings accounts dominate (93.75%), reflecting a trend towards personal savings rather than business banking in E-banking adoption.

## VI. DATA ANALYSIS AND INTERPRETATION

Table 2: Descriptive Statistics of User Perceptions

Variable	Factors	Mean	Median
1	EASY TO USE	4.7	5
2	CONVENIENCE	4.6	5
3	AVAILABILITY	4.5	5
4	NO PAPER WORK	4.5	5
5	TIME SAVING	4.6	5
6	RELIABILITY	4.4	5
7	SECURITY OF TRANSACTION	4.3	4.5
8	TECHNOLOGY SAVVY	4.4	4
9	COST EFFECTIVENESS	4.4	5
10	STATUS SYMBOL	4.1	4

Table 2 represents that the near-identical mean and median values indicate data is normally distributed and shows consistent user perceptions across factors.

Table 3: Reliability Statistics

Cronbach's Alpha	N of Items
.895	10

The collected was posted in SPSS 22 for analysis. From Table 3, to check reliability of data Cronbach's Alpha test was applied and with its value of 0.895 near to 1, the data demonstrates high internal reliability, affirming that the survey items effectively capture the intended factors of E-banking service perceptions.

Table 4 KOM and Bartlett's Test

Kaiser- Meyer-Olkin Measure of Sampling Adequacy.	.896
Bartlett's Test of Sphericity	Approx. Chi-Square
Df	823.457
Sig.	.000

To examine the factors influencing the adoption of E-banking services, factor analysis is applied. For suitability of factor analysis KMO & Bartlett's test had done. Table 4 above demonstrate a  $KMO > 0.5$  and significant level is less than 0.05 suggesting that the data is appropriate for factor analysis. These findings shows that the data is well-suited for factor analysis. The high KMO value demonstrates that the sample

size is sufficient, while the significant result from Bartlett's test confirms that the variables are sufficiently correlated to reveal a meaningful factor structure.

Table 5: Communalities

	Initial	Extraction
EASY TO USE	1.000	.729
CONVEINENCE	1.000	.662
AVAILABILITY	1.000	.698
NO PAPER WORK	1.000	.608
TIME SAVING	1.000	.725
RELIABILITY	1.000	.589
SECURITY OF TRANSACTION	1.000	.640
TECHNOLOGY SAVVY	1.000	.711
COST EFFECTIVENESS	1.000	.616
STATUS SYMBOL	1.000	.361

Extraction Method: Principal Component Analysis.

To check the validity whether the items are capturing the variable factor analysis Table 5 was performed. For checking the validity of data Factor analysis was employed and the extraction of the Majority items in the communalities matrix is more than 0.3 which indicates that scale is valid.

Table 6: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.332	53.325	53.325	5.332	53.325	53.325	3.505	35.054	35.054
2	1.006	10.065	63.39	1.006	10.065	63.39	2.834	28.336	63.39
3	0.879	8.789	72.179						
4	0.612	6.122	78.302						
5	0.513	5.133	83.434						
6	0.442	4.422	87.856						
7	0.425	4.246	92.102						
8	0.313	3.13	95.232						
9	0.262	2.624	97.856						
10	0.214	2.144	100						

Extraction Method: Principal Component Analysis.

As per the Table 6 overall, the two components together explain 63.39% of the overall variation in the data indicating that these two factors capture a significant percentage diversity in user perceptions. This is a good proportion,

suggesting that the identified components are meaningful and provide a robust understanding of the key factors driving user satisfaction and perceptions.

Table 7:Rotated Component Matrix

	Component	
	1	2
EASY TO USE	.149	.841
CONVEINENCE	.202	.788
AVAILABILITY	.375	.747
NO PAPER WORK	.698	.346
TIME SAVING	.762	.380
RELIABILITY	.525	.559
SECUTITY OF TRANSACTION	.767	.225
TECHNOLOGY SAVVY	.725	.431
COST EFFECTIVENESS	.694	.368
STATUS SYMBOL	.601	.010
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization		
a. Rotation converged in 3 iterations.		

Table 7 describes Rotated Component Matrix. The rotation helps to achieve a simpler and more interpretable structure by redistributing the variance more evenly across components. This allows each component to represent a distinct underlying factor more clearly.

The PCA(Principal Components Analysis) with Varimax rotation reveals two primary dimensions in user perceptions:

- Component 1 - Efficiency: Encompasses aspects that make the system efficient, secure, and technologically advanced, while also being seen as cost-effective and a status symbol.
- Component 2 – Usability: Focuses on the ease of use, convenience, and availability of the system, making it user-friendly.

Considering these components can aid in targeting improvements and marketing strategies to address user needs more effectively. For instance, enhancing the perceived security and reliability could strengthen user trust, while further simplifying the usability and ensuring consistent availability could increase user satisfaction.

Table 8: Test Analysis Summary

Hypothesis	t Test Analysis (Sig. 2-tailed)	Null Hypothesis	Interpretation
$H_{01}$ :There is no significant difference in efficiency scores between male and female respondents.	0.757	Accepted	The analysis reveals that gender does not have a significant effect on efficiency scores in this sample.
$H_{02}$ :There is no significant difference in efficiency scores between urban and semi-urban respondents.	0.525	Accepted	The usability scores are similar across urban and semi-urban areas, and any observed difference is not statistically significant.
$H_{03}$ :There is no significant difference in usability scores between male and female respondents.	0.976	Accepted	The analysis reveals that gender does not significantly impact usability scores

H <sub>04</sub> :There is no significant difference in usability scores between urban and semi-urban respondents.	0.946	Accepted	The efficiency scores are similar across urban and semi-urban areas, with no statistically significant difference.
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Table 8 shows the analysis of both factors (efficiency and usability) demonstrates that neither gender (male vs. female) nor location (urban vs. semi-urban) had a statistically significant impact on the outcomes. Our findings indicate that efficiency and usability are constant across all categories in our sample. The high p-values consistently support the null hypothesis, indicating no significant differences in the examined parameters based on gender or location. This consistency reveals that the demographic variables such as gender and region have no effect on how respondents perceive or perform in terms of efficiency and usefulness.

## VII. CONCLUSION

**Key Factors in E-Banking Adoption and Satisfaction**  
 This study examines the primary factors influencing E-banking adoption and customer satisfaction in India's public and private sector banks, focusing on usability, security, convenience, and technological sophistication. Findings reveal that usability and efficiency are paramount for customer satisfaction, with customers particularly valuing E-banking's convenience and time-saving features. The study highlights that E-banking appeals universally across demographics, supporting its adaptability across diverse user groups.

**Core Insights and Strategic Implications** Two core aspects—usability and operational efficiency—emerge as central to the E-banking experience, corroborating earlier studies such as those by Irudayaraj (2019). Security remains a critical concern for users, underscoring the importance of strong digital infrastructure. This is consistent with the findings of Agrawal et al. (2017) and Dhanya & Velmurugan (2021), who suggest that perceived security risk may hinder adoption. To foster customer retention, banks should invest in secure digital systems and simplify the user experience through multi-factor authentication and encryption.

**Comparative Insights: Public vs. Private Sector Banks**  
 The study's comparative approach shows that private

sector banks lead in customer satisfaction due to their customer-centric digital services. Public banks, while progressing in digital offerings, could benefit from enhancing response times and accessibility in rural and semi-urban areas, as recommended by Ramesh and Kumar (2020).

**Directions for Future Research** Future research could explore the influence of emerging technologies such as blockchain and AI on E-banking, and also digital banking's long-term effects on customer loyalty and financial inclusion. Gaining a deeper understanding of these factors could enable banks to adjust their strategies to better meet the evolving demands of digital consumers.

In conclusion this research underscores the significance of usability, security, and efficiency in customer satisfaction with E-banking in India. By proactively addressing these factors, both public and private sector banks can cultivate sustained engagement, trust, and inclusivity, fostering a resilient digital banking ecosystem in India.

## VIII. SUGGESTIONS

### Improvement in security features

To improve security, banks should prioritise multi-factor authentication, encryption, and sophisticated cybersecurity protections for online transactions. This would lessen consumers' fears about potential fraud or hacking, resulting in increased trust in E-banking services.

### Enhanced user experience

Enhance the user experience by simplifying the interface of E-banking software. Given the importance of usability, focussing on establishing simple and easy-to-navigate platforms will promote acceptance, particularly among older people who may struggle with sophisticated technologies.

### Mobile- Friendly Interface

Banks should optimise their mobile apps for smartphones, as many customers are young (18-25 years old). This includes guaranteeing quicker loading

times, more responsive designs, and mobile-first features to better meet the demands of the younger population.

#### Collaboration with FinTech Companies

Banks may cooperate with fintech with fintech startups to keep current with new technologies and develop creative solutions that improve customer experience. This implies banks will effectively while remaining competitive in the digital age.

#### Invest in blockchain and AI technologies

Future expenses shall include research of new technologies like blockchain for safety in transactions, and artificial intelligence for enhancing customers' service provision, for example, through using chatbots. These are scalable solutions to keep up with the expected number of customers.

#### REFERENCES

- [1] Irudayaraj, A. (2019). A comparative study on services provided by private and public sector banks towards e-banking in Thanjavur district. *The International Journal of Analytical and Experimental Modal Analysis*, 11(8). ISSN: 0886-9367.
- [2] Agrawal, D. C., Chauhan, S., & Kukreti, A. (2017). A comparative study of e-banking in public and private sector banks (with special reference to SBI and HDFC Bank in Haridwar). *Asian Journal of Research in Business Economics and Management*, 7(8), 370–389.
- [3] Balaji, D., & Kumar, D. P. (2021). Customer perception on e-banking services – A study with reference to private and public sector banks. *Natural Volatiles & Essential Oils*, 4797–480.
- [4] Behin, M. H., Melvin, C. J., Haralayya, B., Khan, B., & Mishra, R. Technical impact of e-banking on operational performance, service quality, and customer satisfaction in private and public banks.
- [5] Chandravathi, (2022). AN ANALYSIS OF THE VOLUME OF NEFT AND RTGS TRANSACTIONS IN INDIAN PRIVATE SECOTR BANKS. July 2022 IJSR | Volume 7 Issue 7, ISSN: 2455-2631
- [6] Chauhan, V., Yadav, R. & Choudhary, V. (2022). Adoption of electronic banking services in India: an extension of the UTAUT2 model.
- [7] Dhanya, B. K., & Velmurugan, V. P. (2022). Satisfaction level of customers in demographic variables in public sector banks. *Webology*, 19(1), 1017–1027.
- [8] Praveen, S., & Hebbal, C. K. (2021). A review on customers' perception towards e-banking services – A comparative study. *EPRA International Journal of Multidisciplinary Research (IJMR)*, 7(4). ISSN (Online): 2455-3662.
- [9] Alakanti, S. (2017). A comparative study on e-banking and its impact on customer preferences with reference to banks located in urban and rural areas. *International Journal of Research in Management Studies*, 2(11). ISSN: 2455-7595.
- [10] Hada, B. (2016). Online banking and customer satisfaction in public and private sector banks: Evidence from India. *IOSR Journal of Business and Management*, 18(4), 10–20.
- [11] Khizerulla, M. (2022). Factors influencing digital banking service quality: A comparative study between SBI and ICICI Bank in Bangalore. *Journal of Contemporary Issues in Business and Government*, 28(3).
- [12] Kolte, D. M., & Humbe, D. V. R. (2020). Study of UPI/BHIM payment system in India. *International Journal of Science and Research (IJSR)*, 9(12), 228–232.
- [13] Nagadeepa, C. (2020). E-banking acceptance: A study on demographic differences among rural customers with respect to Tumkur Taluk. *Journal of Information and Computational Science*, 10(2), 714–721.
- [14] Naranje, A. G. Future of digital payment system in India: An overview.
- [15] Nithya, C., & Maheswari, P. A STUDY ON CENTRAL DEPOSITORY SERVICES (INDIA) LIMITED. *Turkish Journal of Physiotherapy and Rehabilitation*, 32, 3.
- [16] Ramya, N. (2021). A comparative study of digital banking in public and private sector banks. *IJIRMP*, 9(Special Issue). ISSN: 2349-7300.
- [17] Nithya, C., & Maheswari, P. (2022). A study on central depository services (India) limited. *Turkish Journal of Physiotherapy and Rehabilitation*, 32(3).
- [18] Padmavathi, D., & Reshmaa, M. Utility and satisfaction of e-banking services in public vs. private sector banks.

- [19] Prakash, M. (2023). A STUDY ON CUSTOMER SATISFACTION TOWARDS E-BANKING SERVICES WITH SPECIAL REFERENCE TO AXIS BANK. EPRA International Journal of Research and Development (IJRD), 8(4), 155-158.
- [20] Prasad, A. (2022). A COMPARATIVE ANALYSIS BETWEEN PUBLIC AND PRIVATE SECTOR BANKS CONCERNING E-BANKING SERVICES IN THE BALASORE DISTRICT OF ODISHA. EPRA International Journal of Economic and Business Review (JEBR), 10(9), 1-6.
- [21] Rahulkumar, M., & Dhruv, M. (2020). A relative study on e-banking services provided by selected public and private sector banks in Gujarat. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 17(9), 2424–2432.
- [22] Rajendran, P., & Sudha, D. B. (2019). A study on financial analysis and performance of HDFC Bank. *Journal for the Study and Research*, 11(11), 37–49.
- [23] Singh, M., & Neha. (2020). A study of customer satisfaction on e-banking service quality in public and private sector banks with respect to gender and age. *Asian Journal of Management*, 1(3).
- [24] Sankararaman, G., Suresh, S., & Thomas, T. C. A study on users' opinion towards unified payment interface (UPI) transactions.
- [25] Savaliya, S., & Khasgivala, V. (2024). A comprehensive review of e-banking: Unravelling trends, challenges, and future directions. *Educational Administration: Theory and Practice*, 30(6S), 164–167.
- [26] Sharma, S. (2016). A detailed comparative study on e-banking vs traditional banking. *International Journal of Applied Research*, 2(7), 302–307.
- [27] Singh, A., Rana, S., Sridhar, M., Agrawal, D. K., & Khizerulla, M. (2022). Factors influencing Digital Banking Service Quality: A comparative study between SBI and ICICI bank in Bangalore. *The journal of contemporary issues in business and government*, 28(3), 63-71.
- [28] Suresh, V. A study on service quality perception and satisfaction of e-banking with selected public and private sector banks in Chennai district.
- [29] Tyagi, M., & Fatima, M. A. E-banking facilities: A comparative analysis of State Bank of India (SBI) & Industrial Credit and Investment Corporation of India Bank (ICICI). *IJFMR-International Journal for Multidisciplinary Research*, 5(2).
- [30] Vairavi, M. M., & Krishnamurthy, K. A study on customer satisfaction of e-banking services in public sector bank in Vellore district – an empirical study.