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ANALYZING CUSTOMER PERCEPTIONS OF E-BANKING: A FACTOR ANALYSIS APPROACH

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Abstract
In today's competitive banking landscape, banks are striving to attract and retain customers by offering innovative services through e-banking. New electronic delivery channels are being integrated into existing services regularly, making banking accessible with just a click. Despite the growing popularity of e-banking, many people in India remain unaware of it, and those who are informed often hesitate to use it due to concerns like password hacking, privacy, and security issues. This study examines customer awareness of e-banking and their expectations. The findings reveal that while customers are generally satisfied with the quality of e-banking services, they face technical, administrative, and procedural challenges. To further promote e-banking, banks must prioritize delivering high-quality customer service. "Quality in service" and "customer satisfaction" are critical elements that require focused attention to successfully promote these services.

Introduction

In the age of information technology, e-banking has emerged as one of the most transformative components of modern economic growth. With the increasing use of the internet and computers, e-banking has become a crucial tool for banks to meet customer expectations. Bill Gates famously stated that "banking is essential to a healthy economy, but banks themselves are not" (Serwer, 1995; Jeevan, 2000; Verma, 2001), highlighting the growing influence of electronic innovations, which are impacting banks more than any other financial service providers.

Today, banks are actively striving to attract and retain customers by offering a range of innovative e-banking services. Globally, e-banking is gaining significant traction due to its clear advantages for customers, businesses, and the banking industry as a whole. As a web-based service, electronic banking allows customers to access their accounts online by logging onto the bank’s website with a unique identification number issued by the bank. Once verified, customers can access a wide range of services, including internet banking, Electronic Fund Transfer (EFT), Electronic Clearing Services (ECS), tele-banking, mobile banking, Electronic Data Interchange (EDI), and Automated Teller Machine (ATM) services.

Banks continue to integrate new electronic delivery channels into their existing services, making banking as simple as a click. Despite its rapid growth and widespread adoption globally, awareness of e-banking in India remains low. Many people are unfamiliar with these services, and even those who are aware of e-banking hesitate to use it due to concerns such as password hacking, privacy, and security risks. However, recent studies indicate that an internet-based banking strategy can lead to more profitable, loyal, and committed customers compared to those using traditional banking services (ABA, 2004; Fox, 2005).

This study explores customer awareness of e-banking and their expectations from these services. The paper is organized into four sections. The first section reviews previous studies on customer perceptions of e-banking. The second section outlines the objectives, methodology, and limitations of the study. The third section presents the results and findings of the empirical analysis. The final section provides concluding remarks and recommendations.

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Review of Literature

Several studies have been conducted to analyze customer perceptions of e-banking services. Poon (2008) emphasized that with the rapid growth of internet and computer usage, electronic delivery channels have become an ideal way for banks to meet customer expectations.

Key attributes influencing the use of e-banking include convenience (Venkatesh & Davis, 1996; Elizabeth, 1999; Poon, 2008), perceived ease of use (Davis, 1989; Wang et al., 2003), perceived usefulness (Davis, 1989; Wang et al., 2003), credibility (Wang et al., 2003), cost reduction (Devlin, 1995; Gerlach, 2000; Jun & Cai, 2001; Poon, 2008), trust (Hoffman et al., 1999), security concerns (Sathye, 1999; Poon, 2008), awareness (Simon & Victor, 1994), access to banking options (Elizabeth, 1999), and bank reputation (Mols, 1999).

Uppal (2006) conducted a study using a stratified sample of 500 bank customers to assess the impact of computerization on customer satisfaction across different bank groups. The study concluded that customer service quality was significantly better in fully-computerized and e-banks compared to partially or non-computerized banks.

Verma (2000) analyzed the impact of information technology on public and private sector banks, noting that IT posed a threat to public sector banks. The study highlighted that private sector banks were fully computerized and provided e-banking services, while public sector banks needed to improve their e-banking offerings to stay competitive.

Brian (2000) proposed a framework for evaluating the use of electronic banking services, such as electronic bill payments, credit and debit cards, stored value, and e-cash. The findings suggested that consumers made rational decisions about using alternative payment methods, countering the idea of irrational resistance to change.

Sakthivel (2008) identified 'convenience' as the most important factor influencing customers to adopt e-banking services, while the most common issue faced by customers was the requirement for a high minimum balance.

Kamokodi and Basheer (2008), in interviews with 292 e-banking customers, observed that technology alone was not enough to create a sustainable competitive advantage for banks. They emphasized the importance of maintaining a personal touch to retain existing clients.
Uppal (2008) reported that e-banking customers were generally satisfied with various e-channels and services, but suggested that e-banking services should be enhanced for greater effectiveness in the future.

Based on the review of literature, the present study aims to examine customer perceptions of e-delivery channels in banking.

Objectives of the Study

1. **To assess customer awareness regarding e-banking usage.**
2. **To identify the factors that encourage or discourage customers from using e-banking services.**
3. **To evaluate customer perceptions and expectations of e-banking services.**

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Methodology

This empirical study is based on primary data collected through a well-structured interview schedule comprising both open-ended and close-ended questions. A survey was conducted among 50 customers of nationalized banks in Madhavaram, Chennai city, selected using a convenience sampling technique. The survey, conducted in September 2024, aimed to include all factors identified in previous studies as potentially influencing e-banking usage.

To analyze the data, techniques such as percentage analysis, five-point Likert scaling, rank analysis, and factor analysis were employed. The data was processed using the Statistical Package for the Social Sciences (SPSS) version 16.

Results and Discussion

Previous studies on e-banking users have indicated that the demographic profile of respondents significantly influences the adoption or non-adoption of technology-based banking services. Research suggests that younger generations are more inclined to utilize e-banking services. The demographic characteristics of the sample respondents in this study are detailed in Table 1.

Table 1: Profile of the Respondents

Characteristics	Number	%	Characteristics	Number	%
Education			**Occupation**		
Graduates	10	20	Teachers	36	72
Post Graduates	21	42	Bank Officials	6	12
M.Phil and Ph.D.	6	12	Engineers and Auditors	5	10
Professional	13	26	Students	3	6
Age (Years)			**Monthly Income (Rs.)**		
< 20	1	2	< 10,000	20	40
20-30	27	54	10,000 - 20,000	9	18
30-40	13	26	20,000 - 30,000	15	30
40-50	1	2	30,000 - 40,000	4	8
50+	8	16	40,000 - 50,000	2	4

Among the respondents, 62% were female, and 38% were male. The table also shows that the majority (56%) of e-banking users were under 30 years of age, and 82% were below 40 years old. All respondents had at least an undergraduate degree, and 60% of users belonged to the income group earning Rs. 10,000 and above. Furthermore, 72% of users were employed in higher educational institutions, either as research associates or in teaching professions, while only 6% of the student population were e-banking users. This highlights that most e-banking users are educated individuals with higher incomes.
When asked about their usage of e-banking services, 98% of the respondents reported having used these services since 2000, with 68% beginning since 2005. This indicates a growing trend in the adoption of e-banking services in recent years.

Respondents were also asked to rank their preferences for various e-banking services, assigning ranks from 1 to 7. Scores were then allocated in reverse order, with rank 1 receiving a score of 7, rank 2 receiving a score of 6, and so on. Table 2 presents the total scores assigned to each e-banking service

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based on these preferences.

Table 2: Preferences for E-Banking Services

E-Banking Services	R.1	R.2	R.3	R.4	R.5	R.6	R.7	Total Scores
ATM	38	-	4	-	8	-	-	310
Credit Card	4	6	3	9	7	5	2	235
Debit Card	1	12	9	16	9	5	2	217
Mobile Banking	1	5	7	10	11	8	7	199
Online Banking	2	6	2	13	11	8	10	167
Smart Card	2	5	3	4	14	13	12	156
Tele Banking	2	12	7	5	12	13	10	146

The customers showed the highest preference for ATMs, which received the top score of 310. This was followed by credit and debit cards, mobile banking, and online banking. Tele-banking received the lowest score, with 146 points. Upon further inquiry, it was found that about 68% of the respondents were aware of the hidden costs associated with e-banking services, while 32% were unaware of such costs.

Table 3: Cost-Effectiveness of E-Banking

E-Banking Channel	SA	A	N	DA	SDA	WAS
ATM	58	-	3	-	-	1.96
Credit Card	25	20	8	4	2	1.76
Online Banking	14	23	9	1	-	1.00
Mobile Banking	21	23	15	1	-	0.92
Credit Card	13	17	9	6	5	0.54
Smart Card	9	18	21	4	2	0.44
Tele Banking	9	16	14	6	5	0.36
Note: SA: Strongly Agree; A: Agree; N: Neutral; DA: Disagree; SDA: Strongly Disagree; WAS: Weighted Average Score						

Respondents also rated the cost-effectiveness of various e-banking services on a 5-point scale, with the results presented in Table 3. The table shows that ATMs were considered the most cost-effective option, with a weighted average score of 1.48. Debit cards, online banking, and mobile banking also scored well, indicating that they are seen as providing services at reasonable costs.

Table 4 summarizes the frequency with which the selected respondents use different e-banking services.

Table 4: Problems in Using E-Banking

E-Banking Services	ATM		Credit Cards		Debit Cards		Mobile Banking		Online Banking		Smart Card		Tele-Banking	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Less than 5 times	24	48	8	16	13	26	5	10	10	20	3	6	5	10

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5 to 10 times	2	4	2	4	3	6	-	-	1	2	-	-	-	-
10 to 15 times	3	6	-	-	1	2	-	-	1	2	-	-	-	-
Regularly	20	40	-	-	4	8	3	6	5	10	-	-	-	-
Not at all	1	2	40	80	29	58	42	84	33	66	47	94	45	90
Total	50	100	50	100	50	100	50	100	50	100	50	100	50	100
Note: N: Number state.														

As shown in Table 4, aside from ATM cards, most respondents did not frequently use other e-banking services. Over 80% of the respondents did not use credit cards, mobile banking, smart cards, or tele-banking at all. Furthermore, 66% of the respondents did not use online banking, and only 2% abstained from using ATMs. Among the various e-banking services, ATMs were the most frequently used, with about 40% of customers using them regularly, and another 48% using them fewer than five times a month. These findings highlight the popularity of ATM services among customers. Following ATMs, 10% of the customers regularly used online banking, 8% utilized debit card services, and 6% engaged in mobile banking.

Regarding overall satisfaction, 34% of the customers reported being very satisfied with e-banking services, 56% were satisfied, and 10% remained neutral. The customers were also asked to rank the problems they faced while using e-banking services. These rankings were converted into scores, and Table 5 presents a list of the problems, along with the corresponding ranks and scores.

Table 5: Problems in Using E-Banking

Problems	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	Total Scores
Inadequate knowledge	4	13	2	6	10	4	3	8	231
Lack of knowledge	11	19	4	6	8	4	2	1	277
Lack of infrastructure	4	6	13	9	7	8	1	2	253
Unavailable location of ATM	4	2	14	10	10	5	1	2	243
Not enough ATM centers	6	7	10	10	8	3	6	1	259
Poor network	7	6	3	5	2	13	10	2	214
Time consuming	8	4	1	-	3	8	24	2	184
No problem	5	2	3	8	1	3	2	52	131

Respondents identified a lack of knowledge (score 277) and an insufficient number of ATM centers as the most significant obstacles to using e-banking services. Other notable issues, in order of severity, included inadequate infrastructure, poorly located ATMs, limited knowledge, unreliable networks, and excessive time consumption.

In a separate inquiry, respondents were asked to rate the factors that influenced their use of e-banking services on a five-point scale, ranging from "highly agree" to "highly disagree". The corresponding scores were +2, +1, 0, -1, and -2. The results, presented in Table 6, reveal the weight assigned by the sample respondents to nine key factors that informed their decision to use e-banking services.

Table 6: Factors Influencing the Use of E-Banking

Factors	HA	A	N	DA	HDA	WAS
Accessibility	33	17	-	-	-	1.95
Saves time	31	15	4	-	-	1.54
Reduces cost	25	19	5	2	1	1.13

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Easy to acquire information	29	16	4	1	1	1.46
Self-service	28	17	4	1	-	1.49
More facilities	15	26	7	2	-	1.08
Security/less risk to use	19	15	11	5	-	0.86
Greater control over finance	10	19	11	10	-	0.58
Low hidden cost for services	8	21	13	7	1	0.46
Note: HA: Highly Agree; A: Agree; N: Neutral; DA: Disagree; HDA: Highly Disagree						

Respondents strongly indicated that the primary factors influencing their adoption of e-banking services were, in order of importance: convenient accessibility, speed of use, and easy availability combined with self-service capabilities. These factors received weighted average scores of 1.66%, 1.54%, and 1.44% respectively.

Personal interviews revealed that the majority of respondents (60%) visited banks between two and five times per month. Less than 10% reported visiting more than 10 times, while 18% visited only occasionally.

When asked to rank their reasons for visiting banks, customers identified making large deposits (score 265) and substantial withdrawals (score 248) as the most common purposes, as shown in Table 7. It's worth noting that ATMs have a daily withdrawal limit of Rs. 25,000, which explains the need for in-person visits for larger transactions.

Table 7: Purpose of Visiting the Bank

Purpose	R-1	R-2	R-3	R-4	R-5	R-6	R-7	Total Scores
Mega size deposits	12	21	4	5	1	5	2	265
Mega size withdrawals	14	10	1	16	4	4	1	248
Making complaints	8	3	8	17	8	4	2	216
Getting loans/advances	8	7	7	6	8	12	2	210
To access lockers	1	7	16	3	14	6	3	198
To get new information	4	2	11	3	12	16	2	174

Custormers had been asked to express their view in writing on such points as e-banking, etc., like 'fully agree', 'agree', 'transit', 'disagree' and 'completely disagree'. The points awarded were 2, 1, 0, -1, and -2, respectively. The weighted average scores were calculated and they are shown in Table 8.

Table 8: Attitudes on Different Aspects of E-Channels

Statements	SA	A	N	DA	SDA	WAS
E-channels are necessary in the competitive world for new economy of India	24	19	7	-	-	1.36
E-channels are improving day by day	18	27	5	-	-	1.32
E-channels have bright future in global age	26	14	8	1	1	1.30
E-channels improve the quality of service in banks	16	26	6	2	-	1.12
E-channels make online purchase of goods	12	23	8	7	-	1.00
E-channels charge more hidden costs	12	24	10	3	1	0.86
E-channels are fulfilling all our requirements in the e-age	10	18	17	5	-	0.66

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Many formalities are required to get money through from the banks	10	31	7	2	-	0.98
E-channels are creating strong social relations among the bank customers and bank employees	8	19	14	10	-	0.38
E-channels help to manage transformation in office work	10	22	16	2	-	0.80
E-channels sometimes create technical hurdles to make payments	9	22	14	5	-	0.70
E-channels creating more confusion for customers	7	19	11	1	-	0.16
Note: WAS: Weighted Average Score						

The customers concurred that e-banking provides privacy and is essential in the competitive global economy, and they also shared the belief that it has a promising future. However, regarding other aspects of e-banking, such as causing confusion among customers and hidden costs, they maintained a neutral stance.

Factor Analysis

To identify the underlying constructs and examine the relationships among variables influencing consumers' perceptions of e-banking services, factor analysis was employed. A total of 18 variables were selected based on existing literature. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded a value of 0.59, indicating that the sample was sufficiently adequate. The Bartlett test of sphericity (chi-square = 369.153, $p < 0.01$) validated the suitability of using factor analysis.

Principal component analysis was utilized for factor extraction, with orthogonal varimax rotation applied. Variables with communalities greater than 0.50 were retained. The latent root criterion was employed, extracting factors with eigenvalues greater than one. All 18 variables had communalities exceeding 0.50 and were therefore included in the analysis. The communalities of the variables are presented in Table 9.

Table 9: Communalities

Variables	Communalities	Variables	Communalities
Cost effective	0.796	Privacy	0.761
Access	0.866	Consumer satisfaction	0.773
Accuracy	0.689	Online purchase	0.647
Efficiency	0.723	Social relation	0.724
Security	0.775	Satisfactory service	0.737
Time saving	0.747	High hidden cost	0.675
Safe to use	0.710	Formalities	0.661
Confusion	0.727	Technical hurdle	0.552

For the study, six factors with eigen-values greater than one were extracted. The eigenvalues of the six factors, along with the cumulative percentage of variance, are presented in Table 10.

Table 10: Total Variance Explained

VALUE	TABLE 10:	VARIANCE EXPLAINED	
Factor	**Initial Eigen-Values**	**% of Variance**	**Cumulative %**
F1	4.352	24.178	24.178

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F,	2.818	15.657	39.835
F3	1.857	10.318	50.154
F,	1.614	8,968	59,122
F2	1.296	7.198	66.320
F	1.119	6.217	72.539

The percentage of total variance, which serves as an index to determine how well the factor solution accounts for what the variables collectively represent, was found to be 72.539%.

Table 11 presents the factor loadings of the variables under each of the six extracted factors

Table11: Rotated Component Matrix (Factor Loading >0.50)

Variables	F_1	F_2	F_3	F_4	F_5	F_5	F_6
Cost-effective	0.654						
Cost-effective	0.654						
Access							0.784
Access							0.784
Accuracy			0.548				
Efficiency				0.774			
Security				0.865			
Time saving							0.742
Risk use					0.627	0.627	
Confusion					0.744	0.744	
Quality	0.670						
Consumer	0.783						
Satisfaction	0.764						
Online purchase		0.791					
Social relation			0.675				
Satisfactory service					0.779	0.779	
High hidden cost		0.515					
Formalities		0.717					
Skill required		0.648					
Technical hurdle							

The first factor, F1, represents consumer satisfaction, encompassing aspects such as cost-effectiveness,

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quality customer service, necessity in the global competitive economy, and enabling online purchases. This factor is the most significant, accounting for 24.18% of the variance before rotation.
The second factor, F2, pertains to the challenges customers encounter in e-banking usage, which can be termed "problems in e-banking." This factor includes formalities, technical hurdles, reduced social interaction with banks, and the need for skill upgradation. F2 explains 15.66% of the variance among the variables.
The third factor, F3, represents "banks' reliability," encompassing accuracy, privacy, and satisfactory service from the e-banking user's perspective. F3 accounts for approximately 10.32% of the variations, and the first three factors collectively explain 50.15% of the variations.
The fourth factor, F4, also represents "bank's efficiency," which includes efficiency and the provision of security to customers. These variables have factor loadings exceeding 0.77.
The fifth factor, F5, is a negative factor related to e-banking usage, encompassing high hidden costs, confusion, and risk, with correlations of 0.779, 0.774, and 0.627, respectively.
The sixth factor, F6, pertains to "accessibility," which includes access and reduced time consumption.

Conclusion

The study reveals that customers are generally satisfied with the quality of e-banking services. However, it is notable that among the various e-banking services, only ATM usage is more popular, primarily due to its cost-effectiveness. Despite this, customers encounter challenges when utilizing e-banking services, including technical hurdles, excessive formalities, limited social interaction with banks, the need for skill up gradation, lack of knowledge, and an insufficient number of ATM centres. To increase the adoption of e-banking services, it is recommended that banks conduct more training programs for customers through demo fairs at their centres.
Furthermore, the empirical analysis highlights that in the competitive global landscape, promoting e-banking services requires banks to prioritize quality in customer service. The key phrases "quality in work" and "customer satisfaction" must be given utmost attention to effectively promote a product.

Limitations of the Study:

1. The sample size of respondents was relatively small.
2. The study was conducted at a micro level, focusing solely on customers of a single branch of a nationalized bank.
3. A non-probability convenience sampling technique was employed in selecting bank customers.

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