Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 4 Issue 3 (2024)

Exploration of Reliability and Security of E- Banking: Selected Urban Cooperative banks

Binal Patel[1], Dr. Ritesh Patel[2]

[1]Research Scholar, Parul Institute of Commerce, Parul University, Vadodara

[2]Assistant Professor, Parul Institute of Commerce, Parul University, Vadodara

Abstract:

The rise of E-banking has introduced unprecedented convenience and accessibility for users, transforming traditional banking operations into efficient online experiences. However, this shift brings challenges, particularly in terms of security and reliability, as users now expect robust protections for their financial data and consistent, dependable service. This study investigates the perceptions of security and reliability in digital banking among 290 urban cooperative banking customers. Using factor analysis, we explore key dimensions of e-banking services, focusing on elements like encryption, biometric security, and trust in transaction reliability. The analysis identified two primary factors: security and reliability, each with distinct contributions to overall user satisfaction. The factor loadings revealed that users had mixed confidence in encryption technologies and data privacy measures, with some expressing high levels of satisfaction, while others indicated significant concerns. Additionally, reliability emerged as a critical factor, with findings indicating that a notable portion of customers were dissatisfied with the timeliness and trustworthiness of e-banking services. For data collection, a structured survey measured responses on a five-point Likert scale, assessing variables such as trustworthiness, encryption effectiveness, privacy maintenance, and personal security practices. Through the use of descriptive and factor analysis, we quantified customer sentiments and identified patterns in user satisfaction. The results suggest that while there is moderate confidence in digital banking security, the reliability of service delivery remains an area for improvement. Banks should consider addressing these findings by enhancing transparency in their security protocols and strengthening service consistency to better meet user expectations in digital banking environments.

Keywords: Exploration, Reliability, Security, E- Banking, Urban Cooperative Bank

1) Introduction:

The rise of digital banking has revolutionized how people and businesses handle financial transactions, providing unprecedented ease and accessibility. Yet, this shift also brings crucial challenges, especially in ensuring the security and reliability of online banking services. As these platforms become woven into everyday life, users have come to expect a high standard of trust, data security, and consistent performance (see, for example, Smith et al., 2021; Chen & Liu, 2023). As a result, banks are under increasing pressure to guarantee that their digital services are not only convenient but also secure and dependable. In the context of digital banking, security refers to the protective measures—such as encryption, biometric verification, and privacy safeguards—put in place to shield users' sensitive financial data from unauthorized access. Reliability, on the other hand, reflects users' perception of the dependability and consistency of banking services, focusing on factors like system uptime, accurate transactions, and fulfilment of service commitments **(Rao & Singh, 2022).** The relationship between security and reliability is crucial, as both significantly influence user satisfaction, shaping the trust and confidence users have in digital banking platforms **(Ali et al., 2022).**

2) Objectives:

The objective of this study is to assess and analyse the key factors influencing customer perceptions of security and reliability in E- banking services among urban cooperative bank users, identifying areas for improvement to enhance user trust and satisfaction

3) Research Methods, Data & Variables:

The present research study focusing the qualitative aspects of banking customers under level of security and reliability in digital banking. So obviously, study adopted the quantitative approach as research method for performing the overall study. Moreover primary data collection method used and undertaken 290 total sample design and questionnaire used to data collection tools. The study included total 7 urban cooperative banks from Gujarat involved in the present study with namely Mahesana Urban cooperative bank, Ahmedabad Mercantile cooperative bank, Nutan Nagrik Sahkari bank, Rajkot Nagarik Sahkari Bank, Kalupur Commercial cooperative bank, Surat Peoples cooperative bank, SBBP cooperative bank ltd. The study considered total 8 variables for the security and reliability measuring for E-banking. Followings are major variables in the study:

- Reliability: E-banking services are trustworthy and reputable
- Reliability: E-banking services provide encryption to protect against unauthorised intrusion
- Reliability: E-banking services are provided on time as part of my commitment
- Security and Privacy: I trust that my personal and financial information is secure
- Security and Privacy: Confidence in encryption and technology to protect my transactions and information
- Security and Privacy: Biometric feature increase the security of e- systems
- Security and Privacy: Privacy is maintained when using my e-banking services with consent
- Security and Privacy: I take precautions to protect my information when using e-banking services

5) Result & Discussion:

Table:1

Level of Security and Reliability of Urban cooperative Banking Costumers

	E-banking services are trustworthy and reputable.	%	E-banking services provide encryption to protect against unauthorised intrusion.	%	E-banking services are provided on time as part of my commitment.	%	I trust that my personal and financial information is secure.	%
Dissatisfied	15	5.17	91	31.38	38	13.10	30	10.34
Extremely Dissatisfied	143	49.31	27	9.31	59	20.34	128	44.14
Extremely Satisfied	27	9.31	47	16.21	59	20.34	28	9.66
Neutral	27	9.31	41	14.14	52	17.93	42	14.48
Satisfied	78	26.90	84	28.97	82	28.28	62	21.38
Total	290	100	290	100	290	100	290	100

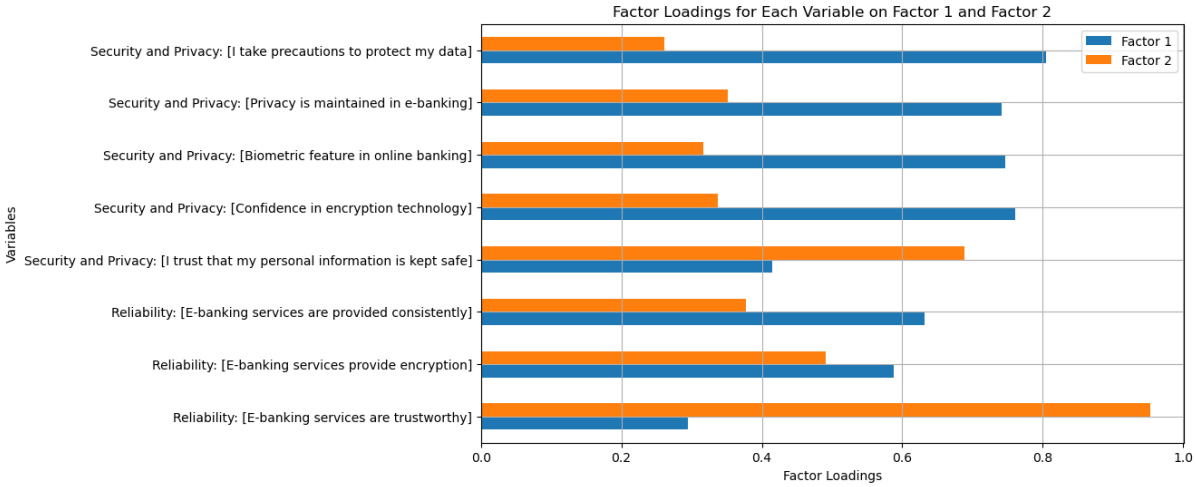
Table: 1.1 Extended

	Confidence in encryption and technology to protect my transactions and information.	%	Biometric feature increase the security of e-systems.	%	Privacy is maintained when using my e-banking services with consent	%	I take precautions to protect my information when using e-banking services.	%
Dissatisfied	73	25.17	36	12.41	52	17.93	44	15.17
Extremely Dissatisfied	32	11.03	64	22.07	47	16.21	52	17.93
Extremely Satisfied	42	14.48	52	17.93	42	14.48	66	22.76
Neutral	66	22.76	57	19.66	58	20.00	50	17.24
Satisfied	77	26.55	81	27.93	91	31.38	78	26.90
Total	290	100	290	100	290	100	290	100

Source: Authors' Data Analysis

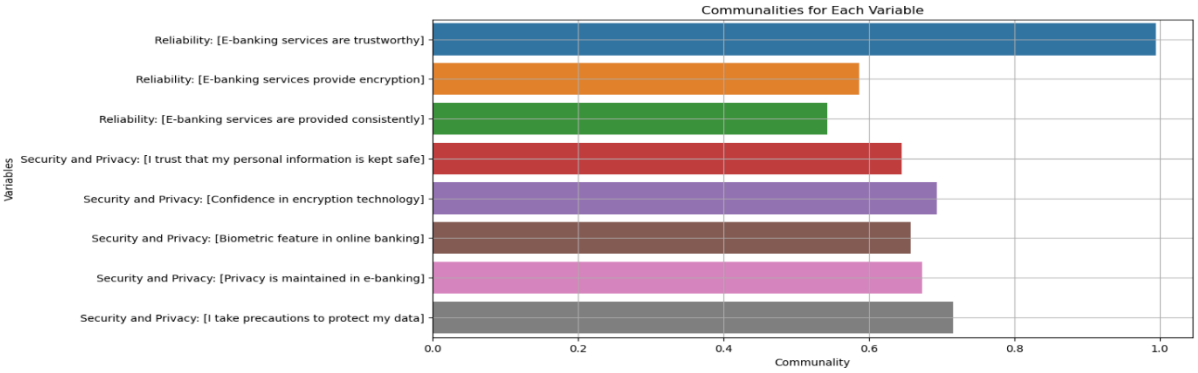
Under the **Trustworthiness and reputation**, nearly half of the respondents (49.31%) feel "Extremely Dissatisfied" with the e-banking services they use, suggesting a major area of concern. However, some users (26.90%) reported feeling

Figure:1 Factor Loading



"Satisfied," and a smaller portion (9.31%) said they were "Extremely Satisfied," showing a mixed but generally cautious attitude toward trust in e-banking. In terms of encryption for protecting against unauthorized access, opinions are somewhat split. Around 31.38% of respondents are "Dissatisfied," while 28.97% express satisfaction. A smaller 9.31% feel "Extremely Dissatisfied," which indicates that while some users are concerned about security, there is also a level of appreciation for the protections offered by encryption. **Regarding the timeliness of e-banking services**, users' opinions are varied. About 28.28% of respondents are "Satisfied," while 20.34% feel "Extremely Dissatisfied." This split suggests that while some customers are pleased with timely service, others feel it is an area where banks could improve.

Figure:2 Communalities from Factor Analysis



A Security of personal and financial information is a major concern, with 44.14% of respondents indicating they are "Extremely Dissatisfied." Despite this, 21.38% of respondents feel "Satisfied," which suggests a trust gap in the security of financial data that banks could address by being more transparent and providing additional assurances. When asked about **confidence in encryption and technology**, responses are more balanced. Around 26.55% feel satisfied, while 25.17% report dissatisfaction. This balance hints at a moderate level of confidence in encryption, though there are users who still have doubts. **Biometric security features received** a wide range of responses. About 27.93% of respondents feel "Satisfied" with biometric measures, yet 22.07% are "Extremely Dissatisfied." This diversity of opinion shows that while biometrics are seen as an improvement in security by some, others may be sceptical of their effectiveness. **Privacy in e-banking has the highest satisfaction rate** among the areas surveyed, with 31.38% of respondents feeling satisfied with how their privacy is maintained. However, there remains a portion (17.93%) who feel "Extremely Dissatisfied," indicating ongoing privacy concerns among a subset of users.

Finally, when it comes to **personal precautions with e-banking**, 26.90% of respondents reported feeling satisfied about the steps they take to protect their own information, while 17.93% were "Extremely Dissatisfied." This

pattern suggests that while many users are proactive in their own security practices, they still seek reassurance from their banks about overall safety.

Table:2 Factor Loading

Factor Loadings:	Factor 1	Factor 2
Reliability: [E-banking services are trustwo...	0.294364	0.9532
Reliability: [E-banking services provide enc...	0.588471	0.490766
Reliability: [E-banking services are provide...	0.632347	0.377644
Security and Privacy: [I trust that my pers...	0.414418	0.687987
Security and Privacy: [Confidence in encryp...	0.761229	0.337594
Security and Privacy: [Biometric feature in...	0.746147	0.317325
Security and Privacy: [Privacy is maintaine...	0.741045	0.351848
Security and Privacy: [I take precautions t...	0.804748	0.261396

Source: Authors' Data Analysis

The first reliability variable has a high communality of 0.995, indicating it is very well-represented by the factors. The other two reliability variables have moderate communalities (0.587 and 0.542), suggesting these items are somewhat represented but could potentially have unexplained variance.

Security and Privacy Indicators:

Most of these items have communalities in the range of 0.64 to 0.72, indicating a good representation by the factors. This shows that these security and privacy-related items are relatively well-captured by the extracted factors, suggesting a consistent theme among the indicators in this category.

Factor loadings show how much each variable contributes to each factor. Loadings above 0.5 are typically considered strong, but lower values can still be informative.

Factor 1:

Primarily loaded on security and privacy items. For example, the variable "I take precautions to protect my information when using e-banking services" has a high loading of 0.804 on Factor 1.

Other high loadings include "Privacy is maintained when using my e-banking services with consent" (0.741) and "Biometric feature increases the security of e-systems" (0.746).

This suggests that Factor 1 represents the security and privacy aspects of digital banking services.

Factor 2:

Heavily loaded on the reliability indicators, especially the item "E-banking services are trustworthy and reputable" (0.953).

Other reliability items also load moderately onto this factor, which indicates that Factor 2 likely represents reliability.

The analysis reveals two main factors:

Factor 1 (Security and Privacy): High loadings from items related to security features (such as encryption and biometric security) suggest this factor is focused on the perceived security and privacy aspects of e-banking.

Factor 2 (Reliability): This factor is mainly associated with the trustworthiness and timeliness of e-banking services, indicating users' perceptions of the dependability of these services.

This breakdown provides insights into how users perceive different aspects of e-banking, with distinct concerns around both security/privacy and reliability. The results suggest that improvements in these areas could enhance overall user satisfaction with digital banking services.

The factor analysis results suggest that user perceptions of e-banking services can be broadly categorized into two main areas: Security and Privacy and Reliability.

Users associate security and privacy with aspects such as encryption, biometric features, and maintaining privacy consent. These factors are well-represented by the high loadings on Factor 1, indicating that these are core concerns for users.The relatively high communalities for security items indicate that users perceive these features as integral to the security of e-banking services. Improvements or reassurances in these areas could significantly impact users' trust and satisfaction.

This factor points to a potential focus area for banks to further enhance security measures, increase transparency, and communicate these measures effectively to build user confidence in the safety of e-banking.Reliability is mainly represented by users' perceptions of trustworthiness, reputation, and timeliness in service delivery, with high loadings on Factor 2. This suggests that reliability is a distinct factor that affects user satisfaction separately from security.

Table:3 Communalities

Communalities:	
Reliability: [E-banking services are trustwo...	0.995239
Reliability: [E-banking services provide enc...	0.587149
Reliability: [E-banking services are provide...	0.542478
Security and Privacy: [I trust that my pers...	0.645069
Security and Privacy: [Confidence in encryp...	0.693439
Security and Privacy: [Biometric feature in...	0.65743
Security and Privacy: [Privacy is maintaine...	0.672944
Security and Privacy: [I take precautions t...	0.715946

Source: Authors' Data Analysis

Lower communalities for some reliability items suggest that while reliability is important, it may not be the sole defining aspect for users compared to security. Nevertheless, maintaining a strong reputation for trustworthiness and timely service is essential. Banks may benefit from ensuring consistent service performance, as well as addressing any gaps that could affect the perceived dependability of e-banking services.

Communalities reflect the proportion of each variable's variance that is explained by the extracted factors. High communalities indicate that a large portion of the variance is accounted for by the factors, making the variables well-represented in the analysis.

Conclusion:

Overall, the survey reveals significant dissatisfaction in several areas, particularly around trust, financial information security, and encryption. Privacy maintenance and encryption confidence are relatively more positive but still not overwhelmingly satisfactory. These findings suggest that banks could benefit from enhancing communication about their security features and increasing transparency to address these user concerns and improve customer satisfaction with digital banking services. The factor analysis indicates that Security and Privacy and Reliability are the two most critical dimensions influencing users' perceptions and satisfaction with e-banking services. Addressing these areas by enhancing

security features and maintaining service reliability could lead to higher overall satisfaction and user confidence in digital banking.

Reference:

1. Ali, M., Ahmed, S., & Khan, N. (2022). User satisfaction and trust in digital banking platforms: An analysis of security and reliability factors. Journal of Financial Technology, 18(4), 245-259.
2. Rao, P., & Singh, R. (2022). The impact of security measures on user trust in digital banking services. International Journal of Banking and Finance, 23(3), 150-168.