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"HINDRANCE OF DIGITAL E-BANKING SERVICES: AN ANALYTICAL INVESTIGATION ON COOPERATIVE BANKING"

Binalben Arvindbhai Patel[1]*, Dr. Ritesh Patel[2]

[1*]Ph.D. Scholar, Parul Institute of Commerce, Parul University, Waghodiya,Vadodara-391760
[2]Assistant Professor, Parul Institute of Commerce, Parul University, Waghodiya,Vadodara-391760

Abstract

Digital banking is mostly associated with its application, backend process and internet connectivity. Apart from this, many such hindrances impact digital banking for respective customers. The present paper used a qualitative research method the achieve the research objectives as well as an aggregate collection of 290 samples of customers from different cooperative banks in Gujarat. The study has found no significant variation among cooperative banks for hindrance factors in digital E-banking services whereas Significant variation was found among different categories of hindrance factors as well as also 14 hindrance factors significantly affecting digital banking of cooperative banks in Gujarat. Technical glitches, service interruption, security, and processing fees play important hindrances during digital banking services.

Keywords: Hindrance, Digital E-Banking, Qualitative Study, Cooperative- Banks, Gujarat

INTRODUCTION

With the edge of Cloud computing and artificial intelligence, the world has emerging new questions in the banking industry. The electronics and digital module of the financial sector faces major issues regarding cybersecurity, privacy & risk of disclosing private information, malware & hacker tactics, risk management, authorisation, money laundering etc. After COVID-19, there has been accelerated growth noted in utilizing the digital payment systems where **(RBI:2021),** higher growth of digital payment reached up to 44 percent growth in 2021 against 26 percent in 2020. The mobile wallet's transactions have reached to 411 billion from 1.13 billion transactions in 2021 (first quarter). The mobile-based payment reached to around 8 billion against around 937 million transactions during 2021. So, ultimately traditional banking break up with digital banking services initiated during the period. but all are not running well concerning digital banking services where security risks, lack of customer awareness level, lack of technology and reaches, lack of simple usability, inappropriate transaction costs, card-related risks like hacking/ skimming, ATM-related issues etc., are now placed as challenges for digital banking.

2) Objectives:

- To Identify and Explore major hindrance factors in digital banking.
- An Analysis & Exploration of differences in constrained variables of digital banking in cooperative banks.
- To Identify factors affecting the Digital E-banking Services of Cooperative Banks.

3) Literature Review:

Pandhy: 2023 has identified digital disruption in supply and demand, where major changes and technical gaps create challenges and problems for the users in digital banking services. The personalization, efficiency and conveniences affected through digital disruption in positive and negative way. There has been leverage in contactless payment in utility bills as well as allow in social media activities.

Tapas D.G (2023), has undertaken research study on emerging issues in Digital Banking with approach of descriptive research. The study identified the major risk in Digital banking as Cyber Risk with malware & Advance Persistent Threat to Banking Networks, Transactional Risk in general, Risk of Break Privacy & Disclose Data, third-party services Risk where Banks collaborate with third-party services major risk, and Technology Stability Risk as well as Dynamic level impact to the daily transactions undertaken by costumers.

M. Mohan (2021), has undertaken to explore the digital banking problems in Telangana state where the major gap was noted for the lowest ATM as part of the digital banking services. Moreover, Network issues and social and Individual

Attitudes affect digital banking services. In addition, the security of digital banking and technical gaps also present obstacles in digital banking for banking customers.

Windasari. N (2022), undertook 8 open interviews as well as 400 respondents of banking customers in account of measure responsible factors for digital banking undertakes. The study identified with testing hypothesis regarding ease of use positively affecting to usability of digital banking. If any hurdles or rigid usability are promoted as constraints in digital banking. Moreover, ease of use has been found greatly correlated with features of the respective interface of digital platforms. Thus lack of features and technological advancement is directly creating constraints in digital banking.

4) Research Approach, Variables & Tools:

The present research mostly concentrates on the qualitative approach to identifying major constraints and variations in digital banking for selected cooperative banks in Gujarat. The sampling design undertook major eight banks of the cooperative sector from Gujarat which involved 14th variables for the present research study.

The following are major variables undertaken in the present research study.

Variable: Technical glitches(such as Malfunctions machine)
Variable: Card getting stuck in the machine
Variable: Security concerns (such as card skimming or hacking)
Variable: Internet banking_services interruptions
Variable: Internet banking_Connectivity issues
Variable: Internet banking_Fraudulent activities
Variable: Mobile banking_Chances of misuse due to mobile handset theft
Variable: Mobile banking_Logging in and signing off are not easy.]
Variable: Mobile banking_Lack of security in transactions
Variable: Mobile banking_Lack of appropriate software
Variable: Electronic fund transfer_Transactional fees
Variable: Electronic fund transfer_Technical failures can disrupt the entire process
Variable: Electronic fund transfer_Waiting for a long time to complete a transaction
Variable: Electronic fund transfer_Vulnerable to security risk_such as identity theft, phishing etc

There 290 aggregate samples have been included which are drawn from various cooperative customers from different cooperative banks in Gujarat. The present research study has utilised the major statistical tools like mean ranking, Kruskal Wallis, ANOVA, Sign Test and bar chart, heat map, tree map etc, also applied to narrate the analysis result.

5) Significant Output:

The significant output represents the major research evidence for the accomplished objective selected under the present research investigation. The research problems regarding identifying the major issues for hindrance in digital banking explored through mean rating tools which represent the hindrance factor with their intensity. **Table: 1** shows the mean rating as respective to their intensity.

Table: 1
Comparative Mean Rating for Identify Frequent Problem

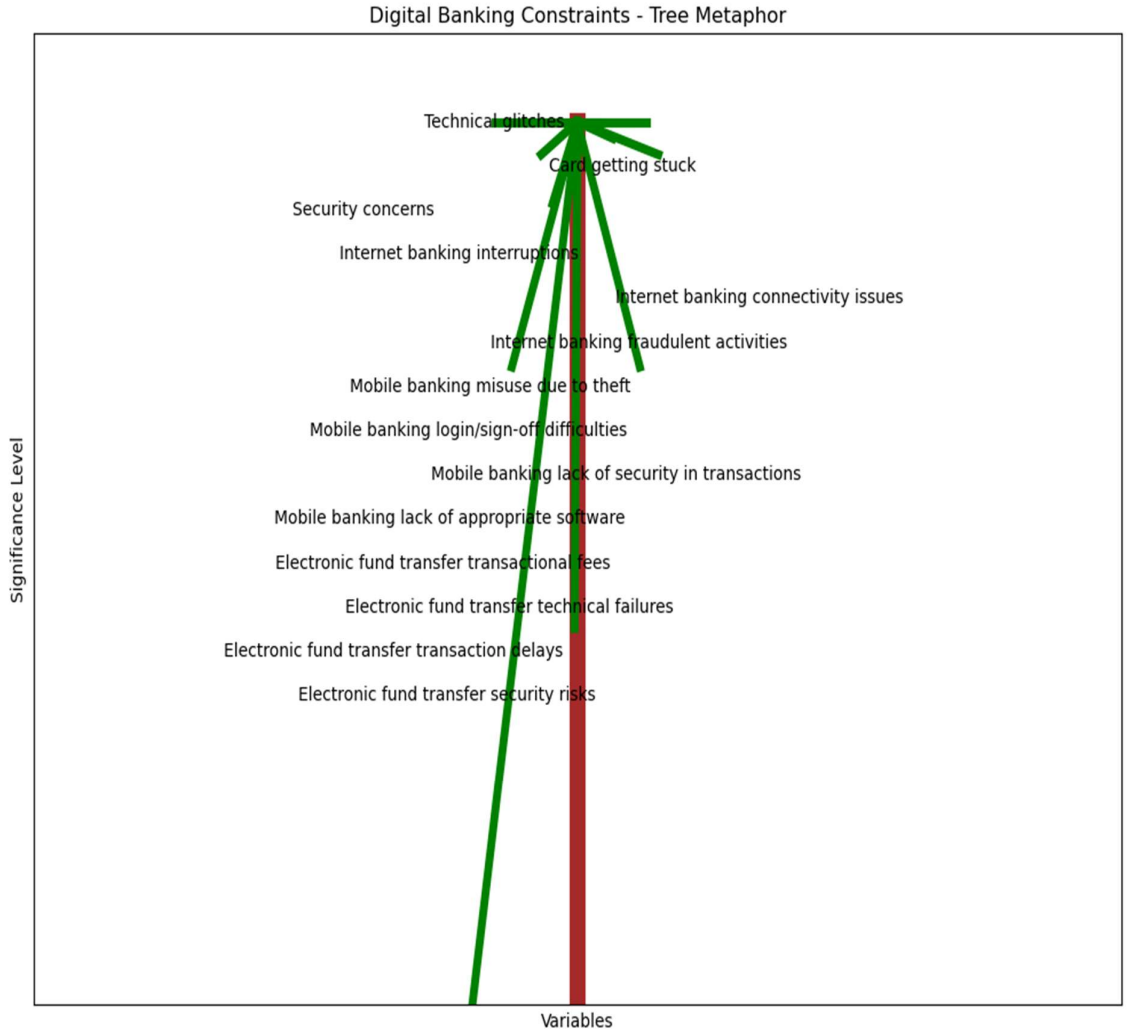
Ranked Variables by Mean Ratings (Higher is More Intense Constraint):
1. Technical glitches(such as Malfunctions machine) - Mean Rating: 3.20
2. Card getting stuck in the machine - Mean Rating: 2.05
3. Security concerns (such as card skimming or hacking) - Mean Rating: 2.60
4. Internet banking_services interruptions - Mean Rating: 3.01
5. Internet banking_Connectivity issues - Mean Rating: 2.34
6. Internet banking_Fraudulent activities - Mean Rating: 2.58
7. Mobile banking_Chances of misuse due to mobile handset theft - Mean Rating: 3.01
8. Mobile banking_Logging in and signing off are not easy.] - Mean Rating: 2.28
9. Mobile banking_Lack of security in transactions - Mean Rating: 2.58
10. Mobile banking_Lack of appropriate software - Mean Rating: 2.55
11. Electronic fund transfer_Transactional fees - Mean Rating: 3.02
12. Electronic fund transfer_Technical failures can disrupt the entire process - Mean Rating: 2.38
13. Electronic fund transfer_Waiting for a long time to complete a transaction - Mean Rating: 2.54
14. Electronic fund transfer_Vulnerable to security risk_such as identity theft, phishing etc - Mean Rating: 2.63

Source: Primary Data Analysis by Author

The mean ranking showing to highest hindrance under digital banking by Technical Glitches and it's mostly affect to centric functions of digital banking. The technically sound in digital banking having less problems occurred. So it seems directly that service interruption in Internet banking has also a higher mean and that's second place in hindrance intensity by mean rating. In addition, handset theft as well as electronic transfer fees emerged as the biggest hindrance in digital banking for customers during this period. The card getting stuck in the machine as compared to the lowest hindrance among all identified for digital banking. Moreover, technical issues with logging in to digital banking emerged as the second lowest hindrance.

Figure:1

Tree Metaphor as Intensity of Hindrances Factors in Digital Banking



Another research object focuses on identifying significant differences among the different cooperative banks in the hindrance of digital banking. Here, **Table 2** presents HSD multiple comparisons between different banks where all banks have not found any significant variation for hindrance factors in digital banking except Kalupur Commercial Co-operative Bank and SBPP Co-operative Bank.

Table: 2

HSD-Significance Comparison Between Banks

Group1	Group2	Meandiff	p-adj	Lower	Upper	Reject
Ahmedabad mercantile co-op bank ltd.	Kalupur commercial co-op bank	-0.2917	0.9	-1.0726	0.4892	FALSE
Ahmedabad mercantile co-op bank ltd.	Mehasana urban co-op bank ltd.	0.1447	0.9	-0.4263	0.7158	FALSE
Ahmedabad mercantile co-op bank ltd.	Nutan nagarik sahakari bank ltd.	0.3846	0.7159	-0.3756	1.1448	FALSE
Ahmedabad mercantile co-op bank ltd.	Rajkot nagarik sahakari bank ltd.	0.45	0.4156	-0.2163	1.1163	FALSE
Ahmedabad mercantile co-op bank ltd.	SBPP co.op. bank ltd.	0.5526	0.1908	-0.1234	1.2287	FALSE
Ahmedabad mercantile co-op bank ltd.	Surat peoples co.op. bank ltd.	0.1143	0.9	-0.5782	0.8067	FALSE
Kalupur commercial co-op bank ltd.	Mehasana urban co-op bank ltd.	0.4364	0.5687	-0.3022	1.1751	FALSE
Kalupur commercial co-op bank ltd.	Nutan nagarik sahakari bank ltd.	0.6763	0.273	-0.2167	1.5693	FALSE
Kalupur commercial co-op bank ltd.	Rajkot nagarik sahakari bank ltd.	0.7417	0.101	-0.0729	1.5562	FALSE
Kalupur commercial co-op bank ltd.	SBPP co.op. bank ltd.	0.8443	0.04	0.0218	1.6668	TRUE
Kalupur commercial co-op bank ltd.	Surat peoples co.op. bank ltd.	0.406	0.7512	-0.4301	1.242	FALSE
Mehasana urban co-op bank ltd.	Nutan nagarik sahakari bank ltd.	0.2399	0.9	-0.4769	0.9566	FALSE
Mehasana urban co-op bank ltd.	Rajkot nagarik sahakari bank ltd.	0.3053	0.7342	-0.311	0.9215	FALSE
Mehasana urban co-op bank ltd.	SBPP co.op. bank ltd.	0.4079	0.4623	-0.2189	1.0347	FALSE
Mehasana urban co-op bank ltd.	Surat peoples co.op. bank ltd.	-0.0305	0.9	-0.6749	0.614	FALSE
Nutan nagarik sahakari bank ltd.	Rajkot nagarik sahakari bank ltd.	0.0654	0.9	-0.7293	0.8601	FALSE
Nutan nagarik sahakari bank ltd.	SBPP co.op. bank ltd.	0.168	0.9	-0.6349	0.9709	FALSE
Nutan nagarik sahakari bank ltd.	Surat peoples co.op. bank ltd.	-0.2703	0.9	-1.0871	0.5464	FALSE
Rajkot nagarik sahakari bank ltd.	SBPP co.op. bank ltd.	0.1026	0.9	-0.612	0.8173	FALSE
Rajkot nagarik sahakari bank ltd.	Surat peoples co.op. bank ltd.	-0.3357	0.7959	-1.0659	0.3944	FALSE
SBPP co.op. bank ltd.	Surat peoples co.op. bank ltd.	-0.4383	0.5647	-1.1774	0.3007	FALSE

Source: Primary Data Analysis by Author

Under the significance difference identification, there is no evidence to reject equality for the hindrance of digital banking among different cooperative banks. Here, all comparison significance p-values found very higher than 0.05 significance level except 0.04 by Kalupur Co-operative Bank with SPBP Co-operative Bank. Here this p value has a higher value that indicates not strong significant evidence for differences in different hindrances in digital banking.

Another research question of the hindrance variable is the significant difference identification emerging here. So that Kruskal-Wallis test performed which clearly showing in **Table: 3**. Its showing to highest Kruskal statistics reached at 81.006 and lowest by 5.32, so it's clearly established relation between Kruskal Wallis statistic and p-value obtained. The higher Kruskal statistics lead lower p-value and lower statistic lead higher p-value. Thus, there has enough evidence through different lower p-value than 0.05 significance level has enough evidence to reject null hypothesis for –

Table:3

Kruskal Wallis Test for Significant Difference in Hindrances Factors

Variable	Kruskal-Wallis Statistic	p-value	Significant
Card getting stuck in the machine	21.25268766	0.00028215	TRUE
Security concerns (such as card skimming or hacking)	47.61506824	1.14E-09	TRUE
Internet banking_services interruptions	81.10062247	1.02E-16	TRUE
Internet banking_Connectivity issues	43.03096895	1.02E-08	TRUE
Internet banking_Fraudulent activities	46.93215407	1.58E-09	TRUE
Mobile banking_Chances of misuse due to mobile handset theft	54.47234387	4.19E-11	TRUE
Mobile banking_Logging in and signing off are not easy.]	31.77298978	2.13E-06	TRUE
Mobile banking_Lack of security in transactions	31.16193525	2.84E-06	TRUE
Mobile banking_Lack of appropriate software	40.7025532	3.10E-08	TRUE
Electronic fund transfer_Transactional fees	37.46205003	1.45E-07	TRUE
Electronic fund transfer_Technical failures can disrupt the entire process	27.20669354	1.81E-05	TRUE
Electronic fund transfer_Waiting for a long time to complete a transaction	28.95807079	7.97E-06	TRUE
Electronic fund transfer_Vulnerable to security risk_such as identity theft, phishing etc	5.320596393	0.25595501	FALSE

Source: Primary Data Analysis by Author

equal distribution of all rating scales under hindrance factors. Only hindrance factors like "Electronic Funds-vulnerable to security risk" have no evidence of significant difference found. So there is enough evidence available for maximum hindrance factors significantly affecting digital banking.

Figure:2

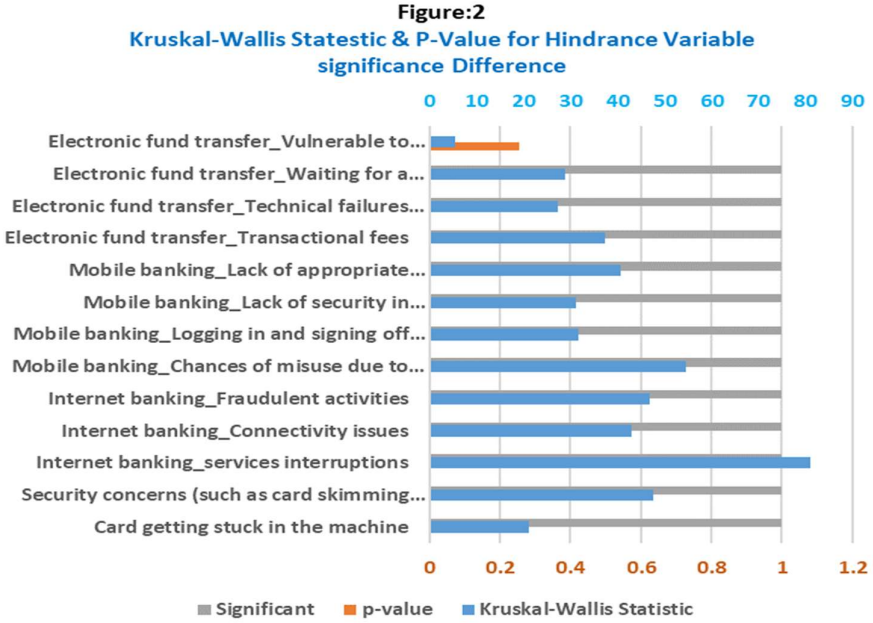


Table:4

Sign Test for Hindrances Factors

Sign Test Results for Technical glitches(such as Malfunctions machine):	Sign Test Results for Card getting stuck in the machine:
Often vs Always: p-value = 0.0000	Often vs Always: p-value = 0.0031
Often vs Rarely: p-value = 0.0005	Often vs Rarely: p-value = 0.0000
Often vs Never: p-value = 0.0000	Often vs Never: p-value = 0.0000
Often vs Ever: p-value = 0.0000	Often vs Ever: p-value = 0.1849
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 1.0000	Always vs Never: p-value = 0.0000
Always vs Ever: p-value = 0.8238	Always vs Ever: p-value = 0.1325
Rarely vs Never: p-value = 0.0000	Rarely vs Never: p-value = 0.5441
Rarely vs Ever: p-value = 0.0000	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.8238	Never vs Ever: p-value = 0.0000
Sign Test Results for Security concerns (such as card skimming or hacking):	**Sign Test Results for Internet banking_services interruptions:**
Often vs Always: p-value = 0.0015	Often vs Always: p-value = 0.0000
Often vs Rarely: p-value = 0.0395	Often vs Rarely: p-value = 0.0521
Often vs Never: p-value = 0.2649	Often vs Never: p-value = 0.0000
Often vs Ever: p-value = 0.0197	Often vs Ever: p-value = 0.0000
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0000	Always vs Never: p-value = 0.0201
Always vs Ever: p-value = 0.4638	Always vs Ever: p-value = 0.0872
Rarely vs Never: p-value = 0.3875	Rarely vs Never: p-value = 0.0000
Rarely vs Ever: p-value = 0.0000	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.0004	Never vs Ever: p-value = 0.6440
Sign Test Results for Internet banking_Fraudulent activities:	**Sign Test Results for Internet banking_Connectivity issues:**
Often vs Always: p-value = 0.0001	Often vs Always: p-value = 0.0000
Often vs Rarely: p-value = 0.0005	Often vs Rarely: p-value = 0.0000
Often vs Never: p-value = 0.7807	Often vs Never: p-value = 0.0985
Often vs Ever: p-value = 0.8482	Often vs Ever: p-value = 0.9196
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0000	Always vs Never: p-value = 0.0000
Always vs Ever: p-value = 0.0003	Always vs Ever: p-value = 0.0000
Rarely vs Never: p-value = 0.0020	Rarely vs Never: p-value = 0.0007
Rarely vs Ever: p-value = 0.0002	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.5727	Never vs Ever: p-value = 0.0640
Sign Test Results for Mobile banking_Chances of misuse due to mobile handset theft:	**Sign Test Results for Mobile banking_Logging in and signing off are not easy.]:**
Often vs Always: p-value = 0.0000	Often vs Always: p-value = 0.0002
Often vs Rarely: p-value = 0.0013	Often vs Rarely: p-value = 0.0000
Often vs Never: p-value = 0.0000	Often vs Never: p-value = 0.0002
Often vs Ever: p-value = 0.0000	Often vs Ever: p-value = 0.4505
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0004	Always vs Never: p-value = 0.0000
Always vs Ever: p-value = 0.3075	Always vs Ever: p-value = 0.0000
Rarely vs Never: p-value = 0.0000	Rarely vs Never: p-value = 0.0250
Rarely vs Ever: p-value = 0.0000	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.0186	Never vs Ever: p-value = 0.0043
Sign Test Results for Mobile banking_Lack of security in transactions:	**Sign Test Results for Mobile banking_Lack of appropriate software:**
Often vs Always: p-value = 0.0000	Often vs Always: p-value = 0.0015
Often vs Rarely: p-value = 0.0120	Often vs Rarely: p-value = 0.0000
Often vs Never: p-value = 0.8624	Often vs Never: p-value = 0.5657
Often vs Ever: p-value = 0.0035	Often vs Ever: p-value = 0.7620
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0000	Always vs Never: p-value = 0.0001
Always vs Ever: p-value = 0.1925	Always vs Ever: p-value = 0.0056
Rarely vs Never: p-value = 0.0241	Rarely vs Never: p-value = 0.0001
Rarely vs Ever: p-value = 0.0000	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.0015	Never vs Ever: p-value = 0.3291
Sign Test Results for Electronic fund transfer_Transactional fees:	**Sign Test Results for Electronic fund transfer_Technical failures can disrupt the entire process:**
Often vs Always: p-value = 0.0000	Often vs Always: p-value = 0.0003
Often vs Rarely: p-value = 0.0434	Often vs Rarely: p-value = 0.0000
Often vs Never: p-value = 0.0000	Often vs Never: p-value = 0.0148
Often vs Ever: p-value = 0.0000	Often vs Ever: p-value = 0.1253
Always vs Rarely: p-value = 0.0000	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0660	Always vs Never: p-value = 0.0000
Always vs Ever: p-value = 0.5572	Always vs Ever: p-value = 0.0000
Rarely vs Never: p-value = 0.0000	Rarely vs Never: p-value = 0.0003
Rarely vs Ever: p-value = 0.0000	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.0095	Never vs Ever: p-value = 0.4153
Sign Test Results for Electronic fund transfer_Vulnerableto security risk_such as identity theft, phishing etc:	**Sign Test Results for Electronic fund transfer_Waiting for a long time to complete a transaction:**
Often vs Always: p-value = 1.0000	Often vs Always: p-value = 0.0000
Often vs Rarely: p-value = 0.0054	Often vs Rarely: p-value = 0.0015
Often vs Never: p-value = 0.0004	Often vs Never: p-value = 0.7926
Often vs Ever: p-value = 0.0569	Often vs Ever: p-value = 0.0029
Always vs Rarely: p-value = 0.0076	Always vs Rarely: p-value = 0.0000
Always vs Never: p-value = 0.0007	Always vs Never: p-value = 0.0000
Always vs Ever: p-value = 0.0728	Always vs Ever: p-value = 0.1770
Rarely vs Never: p-value = 0.5124	Rarely vs Never: p-value = 0.0046
Rarely vs Ever: p-value = 0.4300	Rarely vs Ever: p-value = 0.0000
Never vs Ever: p-value = 0.1265	Never vs Ever: p-value = 0.0009

Source: Primary Data Analysis by Author

For that, here conducted a sign test on 14 identified hindrance factors using a five-point rating scale to understand the intensity of various hindrance factors. The goal was to determine which factors have a statistically significant impact on users, thereby identifying the most critical areas that require attention. The Following are detailed analysis of the results, focusing on the highest-intensity hindrances.

1) Technical Glitches (such as Malfunctions Machine):

The sign test results for technical glitches indicate a strong statistical significance across various comparisons: Often vs. Always (p-value = 0.0000), Often vs. Rarely (p-value = 0.0005), and Often vs. Never (p-value = 0.0000). These results suggest that technical glitches are perceived as a significant hindrance. The consistency of low p-values implies that users frequently encounter and are severely impacted by technical malfunctions, making this a critical area for improvement.

2) Card Getting Stuck in the Machine:

For this factor, comparisons between different frequencies of occurrence show notable p-values as, Often vs. Always (p-value = 0.0031), Often vs. Rarely (p-value = 0.0000), and Often vs. Never (p-value = 0.0000). Users experience considerable inconvenience when their cards get stuck, with the impact being significant even when it happens less frequently (Rarely vs. Ever, p-value = 0.0000). This issue also stands out as a major hindrance in the digital banking experience.

3) Security Concerns (such as Card Skimming or Hacking):

Security concerns are critical, with significant p-values indicating users' worries: Often vs. Always (p-value = 0.0015), Always vs. Rarely (p-value = 0.0000), and Always vs. Never (p-value = 0.0000). It indicates that security concerns are a major hindrance, with high significance in comparisons involving the 'Always' frequency. This underscores the importance of robust security measures in digital banking to mitigate these concerns.

4) Internet Banking Service Interruptions:

Interruptions in Internet banking services are another significant issue: Often vs. Always (p-value = 0.0000), Often vs. Never (p-value = 0.0000) and Always vs. Rarely (p-value = 0.0000), here, service interruptions are perceived as highly disruptive, with significant differences observed across various frequency comparisons. This indicates that consistent service availability is crucial for a smooth digital banking experience.

5) Mobile Banking: Chances of Misuse Due to Mobile Handset Theft:

Concerns about mobile handset theft leading to misuse show high significance: Often vs. Always (p-value = 0.0000), Often vs. Never (p-value = 0.0000), Always vs. Rarely (p-value = 0.0000), the potential for misuse due to theft is a significant hindrance and that's is significant evidence for highlighting the need for enhanced security features in mobile banking applications.

6) Lack of Security in Transactions:

Transaction security in mobile banking is a significant concern: Often vs. Always (p-value = 0.0000), Always vs. Rarely (p-value = 0.0000, Always vs. Never (p-value = 0.0000), Users' perception of insufficient security in mobile transactions is a major hindrance and that emphasizing the necessity for secure transaction protocols.

7) Electronic Fund Transfer: Transactional Fees:

Transactional fees associated with electronic fund transfers are perceived negatively: Often vs. Always (p-value = 0.0000), Often vs. Never (p-value = 0.0000), Always vs. Rarely (p-value = 0.0000), here, Transaction Fees are a significant deterrent, indicating that cost considerations are a critical factor for users when engaging in electronic fund transfers.

8) Internet Banking: Fraudulent Activities:

Concerns about fraudulent activities in Internet banking show significant differences: Often vs. Always (p-value = 0.0001), Often vs. Rarely (p-value = 0.0005) and Always vs. Rarely (p-value = 0.0000). These results indicate that fraudulent activities are a significant concern for users, emphasizing the need for robust fraud detection and prevention mechanisms in Internet banking systems.

9) Internet Banking: Connectivity Issues:

Connectivity issues in Internet banking are perceived as a notable hindrance: Often vs. Always (p-value = 0.0000), Often vs. Rarely (p-value = 0.0000) and Always vs. Rarely (p-value = 0.0000). The high significance of these comparisons underscores the critical need for reliable and consistent internet connectivity to ensure a seamless banking experience.

10) Mobile Banking: Logging in and Signing Off Are Not Easy:

Ease of logging in and signing off in mobile banking is a concern: Often vs. Always (p-value = 0.0002), Often vs. Rarely (p-value = 0.0000), Always vs. Rarely (p-value = 0.0000). The difficulties users face in logging in and signing off highlight the need for user-friendly authentication processes to improve the overall usability of mobile banking applications.

11) Mobile Banking: Lack of Appropriate Software:

The availability of appropriate software for mobile banking shows significant issues: Often vs. Always (p-value = 0.0015), Often vs. Rarely (p-value = 0.0000) and Always vs. Rarely (p-value = 0.0000). The lack of suitable software is a notable hindrance, indicating that ensuring compatibility and accessibility of mobile banking applications is essential for enhancing user experience.

12) Electronic Fund Transfer: Technical Failures Can Disrupt the Entire Process:

Technical failures in electronic fund transfers present significant hindrances: Often vs. Always (p-value = 0.0003), Often vs. Rarely (p-value = 0.0000) and Always vs. Rarely (p-value = 0.0000). These results highlight the critical impact of

technical failures on users' ability to complete transactions, necessitating the need for robust and reliable technical infrastructure in electronic fund transfer systems.

13) Electronic Fund Transfer: Vulnerable to Security Risks (such as Identity Theft and phishing)

Security risks associated with electronic fund transfers are significant: Often vs. Rarely (p-value = 0.0054), Often vs. Never (p-value = 0.0004) and Always vs. Rarely(p-value = 0.0076). The perception of security vulnerabilities, such as identity theft and phishing, underscores the importance of implementing comprehensive security measures to protect users' financial information during electronic fund transfers.

14) Electronic Fund Transfer: Waiting for a Long Time to Complete a Transaction:

The time taken to complete electronic fund transfers is a notable concern: Often vs. Always (p-value = 0.0000), Often vs. Rarely (p-value = 0.0015), Always vs. Rarely (p-value = 0.0000). here, The significant p-values indicate that long wait times are a major hindrance for users, emphasizing the need for efficient and swift processing of electronic fund transfers to enhance user satisfaction.

Conclusion:

Here, identifies several key hindrances in digital banking, with technical glitches, security concerns, connectivity issues and service interruptions standing out as the most impactful. Here, addressing these issues is essential for enhancing user experience and increasing the adoption of digital banking services. Moreover, Efforts must focus on improving system reliability, enhancing security measures, and ensuring uninterrupted service to mitigate these hindrances effectively. In addition there are no any differences among banks for any hindrances in digital banking but strong evidence available for hindrances factors are significant as well as also present with negative impactful to digital banking during period.

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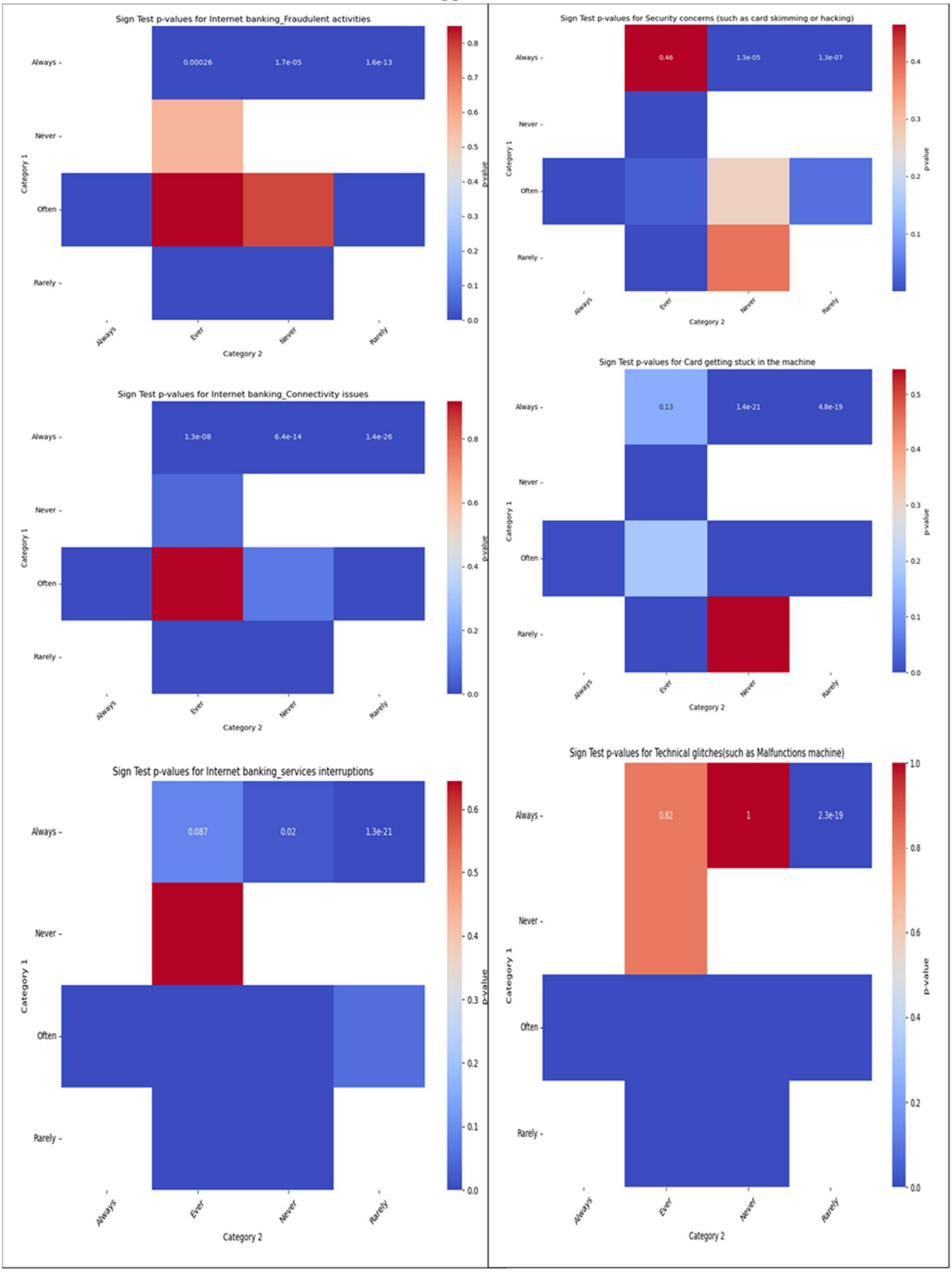
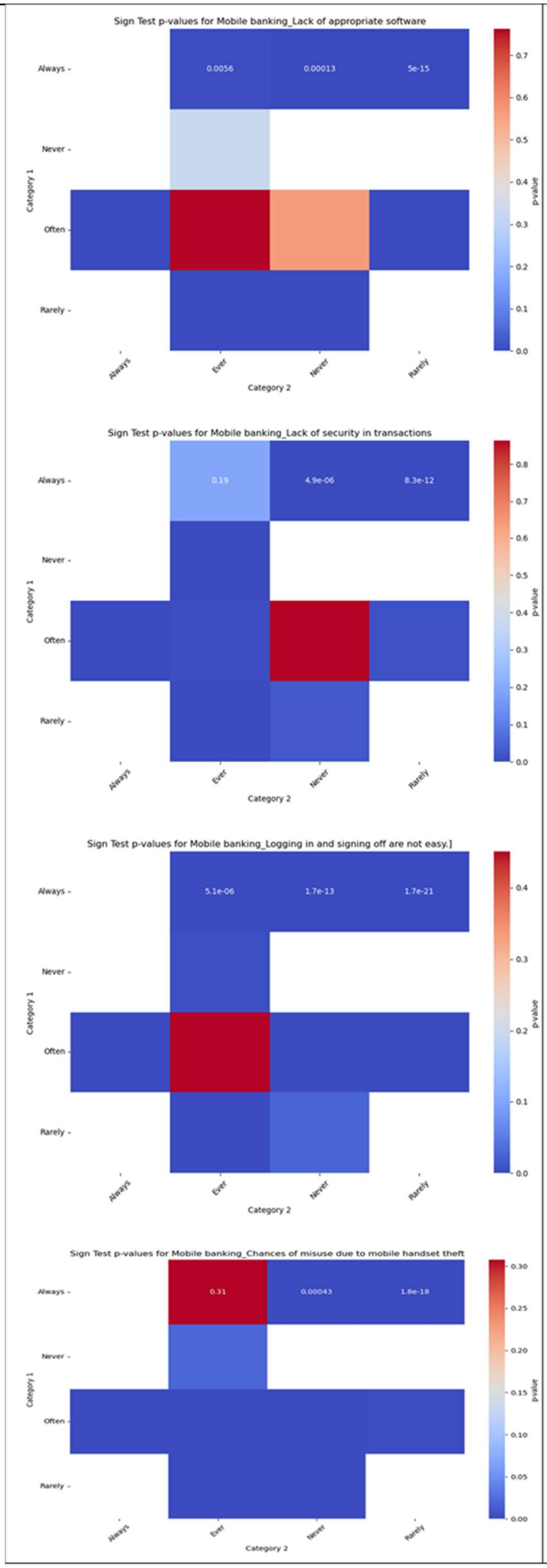
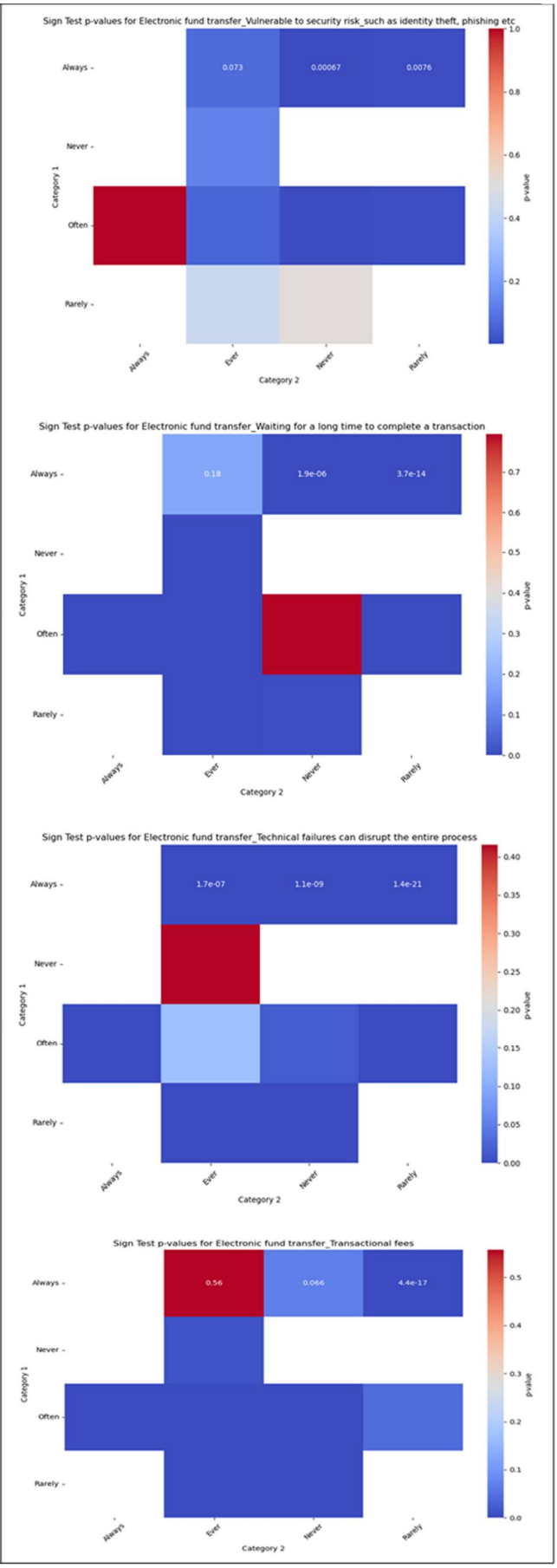
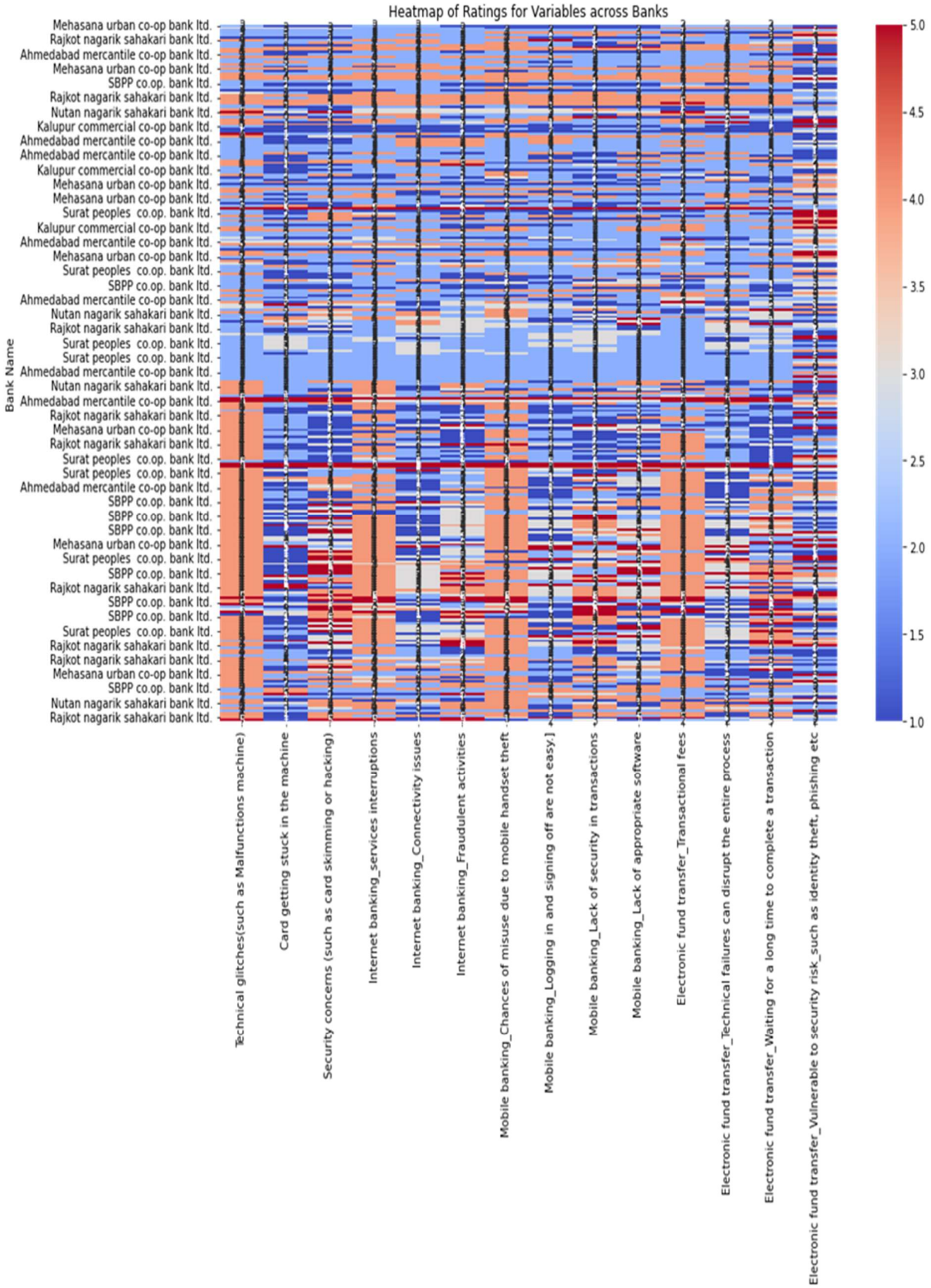
:: Appendix::


Sign Test p-values for Internet banking_Fraudulent activities
0.00026
1.7e-05
1.6e-13
Sign Test p-values for Security concerns (such as card skimming or hacking)
0.46
1.3e-05
1.3e-07
Sign Test p-values for Internet banking_Connectivity issues
1.3e-08
6.4e-14
1.4e-26
Sign Test p-values for Card getting stuck in the machine
0.13
1.4e-21
4.8e-19
Sign Test p-values for Internet banking_services interruptions
0.087
0.02
1.3e-21
Sign Test p-values for Technical glitches(such as Malfunctions machine)
0.82
1
2.3e-19
Always
Never
Often
Rarely
Ever
Category 1
Category 2
p-value


Sign Test p-values for Mobile banking_Lack of appropriate software
0.0056
0.00013
5e-15
Sign Test p-values for Mobile banking_Lack of security in transactions
0.19
4.9e-06
8.3e-12
Sign Test p-values for Mobile banking_Logging in and signing off are not easy.]
5.1e-06
1.7e-13
1.7e-21
Sign Test p-values for Mobile banking_Chances of misuse due to mobile handset theft
0.31
0.00043
1.8e-18
Always
Never
Often
Rarely
Category 1
Ever
Category 2
p-value


Sign Test p-values for Electronic fund transfer_Vulnerable to security risk_such as identity theft, phishing etc
0.073
0.00067
0.0076
Sign Test p-values for Electronic fund transfer_Waiting for a long time to complete a transaction
0.18
1.9e-06
3.7e-14
Sign Test p-values for Electronic fund transfer_Technical failures can disrupt the entire process
1.7e-07
1.1e-09
1.4e-21
Sign Test p-values for Electronic fund transfer_Transactional fees
0.56
0.066
4.4e-17
Always
Never
Often
Rarely
Category 1
Ever
Category 2
p-value


Heatmap of Ratings for Variables across Banks
Bank Name
Mehasana urban co-op bank ltd.
Rajkot nagarik sahakari bank ltd.
Ahmedabad mercantile co-op bank ltd.
Mehasana urban co-op bank ltd.
SBPP co.op. bank ltd.
Rajkot nagarik sahakari bank ltd.
Nutan nagarik sahakari bank ltd.
Kalupur commercial co-op bank ltd.
Ahmedabad mercantile co-op bank ltd.
Ahmedabad mercantile co-op bank ltd.
Kalupur commercial co-op bank ltd.
Mehasana urban co-op bank ltd.
Mehasana urban co-op bank ltd.
Surat peoples co.op. bank ltd.
Kalupur commercial co-op bank ltd.
Ahmedabad mercantile co-op bank ltd.
Mehasana urban co-op bank ltd.
Surat peoples co.op. bank ltd.
SBPP co.op. bank ltd.
Ahmedabad mercantile co-op bank ltd.
Nutan nagarik sahakari bank ltd.
Rajkot nagarik sahakari bank ltd.
Surat peoples co.op. bank ltd.
Surat peoples co.op. bank ltd.
Ahmedabad mercantile co-op bank ltd.
Nutan nagarik sahakari bank ltd.
Ahmedabad mercantile co-op bank ltd.
Rajkot nagarik sahakari bank ltd.
Mehasana urban co-op bank ltd.
Rajkot nagarik sahakari bank ltd.
Surat peoples co.op. bank ltd.
Surat peoples co.op. bank ltd.
Ahmedabad mercantile co-op bank ltd.
SBPP co.op. bank ltd.
SBPP co.op. bank ltd.
SBPP co.op. bank ltd.
Mehasana urban co-op bank ltd.
Surat peoples co.op. bank ltd.
SBPP co.op. bank ltd.
Rajkot nagarik sahakari bank ltd.
SBPP co.op. bank ltd.
SBPP co.op. bank ltd.
Surat peoples co.op. bank ltd.
Rajkot nagarik sahakari bank ltd.
Rajkot nagarik sahakari bank ltd.
Mehasana urban co-op bank ltd.
SBPP co.op. bank ltd.
Nutan nagarik sahakari bank ltd.
Rajkot nagarik sahakari bank ltd.
Technical glitches(such as Malfunctions machine)
Card getting stuck in the machine
Security concerns (such as card skimming or hacking)
Internet banking_services interruptions
Internet banking_Connectivity issues
Internet banking_Fraudulent activities
Mobile banking_Chances of misuse due to mobile handset theft
Mobile banking_Logging in and signing off are not easy.]
Mobile banking_Lack of security in transactions
Mobile banking_Lack of appropriate software
Electronic fund transfer_Transactional fees
Electronic fund transfer_Technical failures can disrupt the entire process
Electronic fund transfer_Waiting for a long time to complete a transaction
Electronic fund transfer_Vulnerable to security risk_such as identity theft, phishing etc
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0