

A Study on Security and Privacy in E-Banking

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Abstract:

This content highlights the importance of “Security and Privacy in E-Banking” and explores the balance between security and user privacy in digital finance. To examine the changing landscape, Discovery has implemented various security measures, including encryption systems, multi-factor authentication and fraud devices, primarily in electronic banking systems. It also examines emerging privacy issues, including data breaches, identity theft, and misuse of personal information. In addition to analysis, the review will also focus on strategies that will respond to the company's income in order to reduce these problems. Focus on your customers and build trust. This includes a comprehensive assessment of technological advances, regulatory compliance and customer education measures. By understanding and solving these problems, banks aim to strengthen their digital processes and create a safe and reliable online financial transaction.

Keywords: Electronic banking, Security measures, Privacy issues, Trust, Digital financial transactions.

1.Introduction:

In recent decades, the financial landscape has undergone a profound transformation with the ascendance of electronic banking, marked by a surge in online transactions and digital financial services. The pervasive adoption of E-Banking has not only ushered in unprecedented convenience but has also introduced a host of security and privacy considerations that are pivotal in ensuring the integrity of these digital financial ecosystems. Organizations are becoming aware of the rapid usage of technology's importance in the lives of customers. The technical advancement in financial transactions, user-interface, purchase and selling, and online/electronic use have been emerging in the industry of banking in the past few years. At present, the competitive online e-commerce market has been providing exceptional facilities and services, particularly in the banking sector in order to retain customers for a longer period. It is being essential to facilitate such customers with high-end services to retain them in a challenging marketplace where every organization is providing the services regarding electronic banking. Electronic services or e-services are more of a significant factor than it ever was in traditional banking means a decade ago. Inclusively, the modes of the e-services provided to the customers have been augmented by banking organizations over the period of technological evolving time .Likewise, the present relationship of the customers and banking organizations depends on such factors that include a long-term aim of reliable and customer-oriented services with a heightening goal to motivate customers to be loyal in the long run. To fill this research gap in the literature, the confirmation-and-disconfirmation theory by Carlsmith and Aronson, (1963) is implied in which the customers need to be satisfied with the expected services that are originated from their own beliefs. With privacy and security, it comes customer satisfaction to be made possible by the e-banking facilities to the customers (Shankar & Jebarajakirthy,

2019; Teimouri & Chegini, 2018). This possibility for customer satisfaction is a mere perception that the services and amenities provided by the banks are more private and secure other than any breach of the security concern should not happen anytime they are using the online facilities (Prasadh, 2018). In order to make this entire procedure better, the electronic banking firms have made sure to make the services customer satisfactory enough by offering more services that can make them choose a particular bank, according to their need other than any organization (Saibil, 2020; Shankar & Jebarajakirthy, 2019). Customers nowadays have an alternative option for every product and service. Numerous of the customers for electronic banking want to have E-services for a longer-term period if offered appropriately. Alongside that, the e-banking customer that uses online services is more inclined towards a strategy to have e-provision of every facility online rather than they would have to transit half of the services online and half of the services through traditional way because of the non-reliability issues. This challenge still to a certain extent needs to be modified at current. These customers want to extend privacy and security regulations, high-end customer satisfaction services, and reliable online facilities to be provided by the electronic medium of online banking applications. To address the literature-practical gap, the chosen variables will mainly satisfy the online customers' needs as the previous researches showed that the number of variables can be essential, but from the most imperative are the privacy and security, customer satisfaction and reliability in electronic services. Additionally, this research shall aim to facilitate banking management, fintech project organizers, and banking industry practitioners for Asian context alongside any other continent for which the case shall be similar.

2. LITERATURE REVIEW

Today the balance of E-banking communication power has been revised for the benefit of customers. The knowledge of these in financial matters are much sharper, customers are better informed of the various banking offers thanks to the various communication means including augmented electronic services via reliable ways. A customer looking for a banking product will always compare with offers offered by other establishments (Han, 2020). To respond to changes in customer behavior, the bank places the customer at the center of the respective concerns with heightened electronic services. Today, the bank focuses on the satisfaction of its traditional customers and for that it fits with the cycle of customer life. If banks fail to offer comprehensive E-banking services to their loyal customers, the customer and bank relationship can be impacted in worse manners as per dynamic relationship marketing theory. Comprehensive and convenient integration of E-banking applications can accelerate the positive impacts of customers regarding the indulgent of e-applications. So, for banking institutes, only digitalization cannot be considered as a progression tool, but also to retain a sustainable relationship with digital customers also consider a significant factor. Therefore, with the heightening impact, E-banking can be influenced by several elucidated factors and if provided right customers can become long-term E-banking loyal clients. Privacy & Security and E-banking Loyalty Privacy and security in the electronic banking system have been a significant factor in the past few years when everything in the technical age in digitalizing. The privacy and security in E-banking can be a highly implemented systematic order for a transaction-based mechanism via internet facilities. Privacy in such terms can be recognized as a user intention towards using online banking via mobiles and laptops or other devices in order to use the online transactional activities. Security in the online banking system or electronic banking (E-banking) denotes a conceptual manner for proper secure and private authorization in the way to let the customer use E-services on the

banking websites. Therefore, the confidence and preference in E-banking services hinged on highly private and secure services to make such customers loyal in the long run. The article of Sathiyavany and Shivany (2018) illustrates the idea of privacy and security in E-banking as the website security to be appreciated and given as a priority to the customers which can involve facilities like encrypting shared data, interactive and secure customers involvement, credit payments and private transactions, and other interrelated activities (Aboobucker & Bao, 2018; Susanto et al. 2013). The study of Jouzdani et al. (2020) also highlights a series of realities that make the composition of the banking industry complex, even paradoxical since the customer seeks both distances through effective management instruments and the proximity through a reassuring human relationship.

Privacy and Security and Customer Satisfaction

Customer satisfaction can be referred to as providing all relevant features in any E-banking application which can conveniently assessable by the customers. It is the peaceful state of mind of e-customers which they can attain by indulging in any E-banking application. Web design and content of any E-banking application can also be the reason for the satisfaction or dissatisfaction of E-customers. Furthermore, banks can deliver many potential benefits of E-banking such as availability of services through 24 hours, adequate privacy measures, convenient accessibly, and reduction in branch operating costs etc.. The persisting researches have shown a favorable impact of providing ample privacy measures to the e-consumers to augment long term customer satisfaction level and loyalty. Customers may face security dilemmas in case of indulging in E-banking applications such as storage issues, unlawful disclosure of location, illegal personal Information assortment etc...

3. Research Methodology:

A. Sample and Survey Administration

The existing rapid increase of electronic services in banking is increasing enormously (Shankar & Jebarajakirthy, 2019). For that, the data presently has been collected from several numbers of private and government banks. Data was collected from E-banking application users from these banks. These banks were only based in the region of Mumbai. The objective behind selecting the target population based in Lahore was that it is one of the most populated and biggest cities which can result in the affluent as well as the high-end data collection means. From all over the electronic service providing banking institutes that is 53 in total number, 8 banks had been narrowed down to collate the research data. Moreover, 400 responses have been added in the compliance of the results to gather comprehensive results. At every stage, the data collection was used with the simple random sampling technique and proportionate sampling technique in order to avoid any biases by the researcher in the whole process while collecting the responses. With the corresponding purpose, in total, 8 major banks have been selected from the overall banks available in Mumbai. Around 8 banks had to be selected in order to make the decree in regulation for the purpose to collate 400 responses in total. 50 responses have been filled by each of the bank's customers. Correspondingly, these questionnaires have been filled with supervision to the extent at which the respondents did not feel uncomfortable at any point alongside any guidance have been directed by the branch manager themselves. All the participants were given an English formatted questionnaire in order to fill with their own will. They were allowed to leave at any time if the questionnaire did not feel appropriate to fill. A high level of anonymity and validity is kept in this survey regard. All the 300 responses have been gathered from self-administered data collection

means and other 100 responses were filed online via Google forms. This has been collated to perform reliability, correlation and other tests on the model to improvise overall E-banking relation to other variables.

Measures and Instrument Development:

The questionnaire was generated in the English language with the method of close-ended questions to be answered by the respondents. The questionnaire consists of two main components which were compiled in one document. These two sections in the questionnaire mainly included demographic questions (name, gender, age, marital status, current occupation, bank account name, bank account type, preferred banking choice and tenure with the bank). All item scales are measures on a 7-point Likert scale. Privacy and security 4 item scale have been assessed by Ramseook-Munhurrun, and Naidoo (2011) besides modifying for the current use. E-banking loyalty was measured using 5 item scale developed by Amin (2016) alongside modification in the items. Demographic variables of users such as gender, age, marital status, current occupation, bank account name and type, preferred banking choice and tenure of the bank have also been utilized in this research which are shown in Table 1.

Table-I Distribution of Respondents on the Basis of Demographic Factors Demographic Variables

Categories	No. of Respondents (N)	N %
Gender	Male 215	53.8
	Female 185	46.3
Age (in years)	18-27 99	25
	28-37 190	47.5
	38-47 80	20
	48-57 24	6
	58 and above	61.5
Marital Status	Single 144	53.8%
	Married 256	46.3%
Current Occupation	Business Man/Woman 56	14%
	Government Employment 77	19.3%
	Private Employment 167	41.8%
	Self-Employed 62	15.5%
	Other 38	9.5%
Account Type	Term Deposits Account 69	17.3%
	Savings Account 117	29.3%
	Current Account 129	32.3%
	SME Banking Account 49	12.3%
	Foreign Currency Account 36	9%
Preferred Banking Type	Traditional Banking 37	9.3%
	Electronic/E-Banking 282	70.5%
	Commercial Banking 24	6%
	Conventional Banking 15	3.8%

Table 2 Standard Deviation, Means and Correlations for the Research Variables

Variables	SD	Means	1	2	3	4	5	6	7	8
1. Age	8.84	33.63								
2.Marital Status	0.48	1.64	.396**							
3.Account Type	1.16	2.67	0.088	0.021						
4.Preferred Banking Choice	1.06	2.36	-0.004	0.140**	0.004					
5.E-Banking Loyalty	1.12	4.65	-.137	0.008	-.130**	.180	0.694			
6.Reliability	1.1	4.46	-.118	0.019	-0.061	.200	.560	0.745		
7.Privacy and Security	1.12	4.64	-.185	-0.047	-0.074	.193	.553	.602	0.741	
8.Customer Satisfaction	1.08	4.47	-.161	-0.047	-0.042	.134	.480	.451	.483	0.704

Note: n = 400, Cronbach’s alpha values are on the diagonal in parentheses.

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

RESULTS

Descriptive Statistics and Correlation Matrix

Prior to conducting the hypotheses testing in the research, a bivariate correlational analysis has been performed on the chosen study variables. In this regard, Table 2 explicates the mean values for each variable, standard deviation numeric, correlational values, and Cronbach alpha statistics. Overall, the correlation matrix results have shown positive and significant relationship values among the variables. The correlation value for privacy and security with E-banking loyalty is 0.553, $p < 0.01$. For privacy and security and customer satisfaction, correlation is 0.483, $p < 0.01$. The significance level is also positive for customer satisfaction and E-banking loyalty which is 0.480, $p < 0.01$. Further, reliability is significant with customer satisfaction at 0.451, $p < 0.01$. The reliability is positive with E-banking loyalty at 0.560, $p < 0.01$. The reliability with privacy and security at initial is significant at 0.602, $p < 0.01$. The correlation matrix additionally includes the positive significant relationship of age and marital status ($r = 0.39$, $p < 0.01$);

4. Privacy Concerns in E-Banking

A. Data Breaches and Identity Theft:

Privacy concerns in E-Banking are heightened by the persistent threat of data breaches and identity theft. The digital nature of transactions exposes users to potential hacking incidents where sensitive financial information can be compromised. Robust security measures are crucial to thwart such breaches and safeguard customer data, preventing unauthorized access and mitigating the risk of identity theft.

B. Information Sharing Practices:

E-Banking platforms often engage in information sharing practices for various purposes, such as analytics, marketing, or collaborations with third-party services. Privacy concerns arise when users' personal data is shared without transparent disclosure or explicit consent. Establishing clear privacy policies, providing opt-in/opt-out choices, and limiting the sharing of sensitive information are crucial

steps to address concerns related to information sharing.

C. Regulatory Compliance and Data Protection Laws:

Privacy in E-Banking is intricately linked to compliance with regulatory frameworks and data protection laws. Financial institutions must adhere to stringent regulations that govern the collection, storage, and processing of customer data. Compliance with laws such as the General Data Protection Regulation (GDPR) or other region-specific regulations is paramount to ensuring the lawful and ethical handling of customer information, alleviating privacy concerns.

D. User Awareness and Education:

Users' awareness and understanding of privacy settings and potential risks play a pivotal role in mitigating concerns in E-Banking. Financial institutions must actively engage in user education initiatives, providing clear information on privacy features, security measures, and best practices. Empowering users with the knowledge to navigate privacy settings and recognize potential threats contributes to a more informed and vigilant user base.

In summary, addressing privacy concerns in E-Banking necessitates a holistic approach, encompassing robust cybersecurity practices, transparent information sharing policies, compliance with regulatory frameworks, and proactive user education initiatives. By prioritizing privacy at each stage of digital financial interactions, banks can foster trust and confidence among their clientele in an increasingly interconnected and data-driven financial landscape.

5. Analysis of Banks' Strategies

A. Investment in Advanced Cybersecurity Infrastructure:

Banks recognize the paramount importance of cybersecurity in the digital age and invest significantly in cutting-edge technologies. This includes advanced firewalls, intrusion detection systems, and secure servers. The continuous evolution of cyber threats necessitates a proactive approach, with banks allocating resources to stay ahead in the arms race against potential attackers.

B. Collaboration with Technology Experts and Cybersecurity Firms:

Recognizing the dynamic nature of cybersecurity challenges, banks often collaborate with external technology experts and cybersecurity firms. These partnerships provide access to specialized knowledge, threat intelligence, and innovative solutions. Collaborative efforts enable financial institutions to leverage external expertise and remain adaptive to emerging cyber threats.

C. Regular Security Audits and Assessments:

Banks conduct regular security audits and assessments to evaluate the robustness of their cybersecurity measures. These assessments may include penetration testing, vulnerability scans, and reviews of security policies. Regular audits help identify and rectify potential vulnerabilities, ensuring that the security infrastructure remains resilient against evolving threats.

D. Transparency in Privacy Policies:

Establishing trust with customers is paramount in E-Banking, and transparency in privacy policies is a key component. Banks strive to articulate their data handling practices clearly, detailing how customer information is collected, used, and protected. Transparent privacy policies not only comply with regulations but also contribute to building customer confidence in the security and privacy of their financial data.

E. Customer Education Initiatives:

Recognizing that informed users are better equipped to navigate the digital landscape securely, banks in-

vest in customer education initiatives. These programs aim to enhance users' awareness of cybersecurity best practices, potential threats, and the importance of privacy settings. By empowering customers with knowledge, banks contribute to a more resilient and security-conscious user base.

In concert, these strategies form a comprehensive approach to addressing cybersecurity and privacy challenges in E-Banking. The synergy of technological investment, external collaboration, regular assessments, transparent policies, and customer education contributes to a robust defense against cyber threats while fostering a trusting relationship between banks and their customers.

6. Building Trust among Customers

A. Communication Strategies in Case of Security Incidents:

Trust is inherently linked to transparency, particularly during security incidents. Effective communication strategies involve promptly informing customers about any security breaches, detailing the nature of the incident, and providing clear instructions on protective measures. Open and honest communication helps manage customer expectations, demonstrating a commitment to their security and fostering trust even in challenging circumstances.

B. Demonstrating Commitment to Customer Privacy:

To build and maintain trust, banks must visibly demonstrate a steadfast commitment to customer privacy. This involves implementing stringent privacy policies, adhering to regulatory standards, and ensuring that customer data is handled with the utmost care. Clear communication regarding privacy practices and continuous efforts to enhance data protection reinforce the perception that customer privacy is a top priority.

C. Feedback Mechanisms and Customer Engagement:

Establishing feedback mechanisms and fostering active customer engagement are pivotal in building trust. Banks can solicit feedback on their security measures, seeking insights into customer perceptions and concerns. Regular engagement through surveys, forums, or informational webinars creates a two-way communication channel, allowing banks to address customer apprehensions promptly and refine their security strategies based on customer input.

D. Responsiveness to Evolving Security Threats:

In the ever-changing landscape of cybersecurity, trust is earned by the ability to adapt and respond swiftly to emerging threats. Banks that proactively anticipate and address evolving security challenges demonstrate a commitment to safeguarding customer interests. This responsiveness can involve continuous monitoring, updates to security protocols, and the integration of advanced technologies to stay ahead of potential risks.

In essence, building trust among customers in E-Banking hinges on transparent communication, a strong commitment to privacy, active engagement, and a proactive stance against evolving security threats. By consistently prioritizing these elements, banks can cultivate a trusting relationship with their customer base in the dynamic and interconnected realm of electronic banking.

Conclusion:

This research contributes to the domain of electronic banking facilities and electronic services provided to online E-banking users. The integrated aspects of e-banking services, high-end technology advancement, private and secure transactions, managerial impacts of customer services, for satisfactory facilities, and reliable assistance needs to be inclined in the provision of e-banking services. The

presented theoretical framework of this research has drawn all basic antecedents which influence electronic banking loyalty via privacy and security as an independent variable, mediating effect of customer satisfaction, and moderating effect of reliability. These variables and the elucidated path sustained to evaluate the overall impact that E-banking loyalty is influenced by all these variables.

References

1. R. Yadav, V. Chauhan, and G. S. Pathak, "Intention to adopt internet banking in an emerging economy: A perspective of Indian youth," in *International Journal of Bank Marketing*, vol. 33, no. 4, pp. 530-544, 2015.
2. P. Malhotra, and B. Singh "The Impact of Internet Banking on Bank Performance and Risk: The Indian Experience," in *Eurasian Journal of Business and Economics*, vol. 2, no. 4, pp. 43-62, 2009.
3. S. W. Ezzi, "A Theoretical Model for Internet Banking: Beyond Perceived Usefulness and Ease of Use," in *Archives of Business Research*, vol. 2, no. 2, pp. 31-46, Apr. 2014.
4. H. M. Rakesh, and T. J. Y. Ramya, "A Study on Factors Influencing Consumer Adoption of Internet Banking in India," in *International Journal of Business and General Management*, vol. 3, no. 1, pp. 49-56, Jan. 2014.
5. M. V. Gupta, "The Impact of Digitalization on Indian Banking Sector," in *International Journal of Trend in Scientific Research and Development*, p. 5, 2018.