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A Multi-dimensional Comparative Analysis of Consumer Behaviour and technology readiness in E-banking

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Abstract

E-banking technology has advanced quickly in tandem with the expansion of online banking. Business models have changed as a result of e-banking, particularly in regard to user convenience and rewards. However, it appears that users are still having problems with e-banking's features and security, which leads to user discontent. Therefore, by integrating the Technology acceptance model 3 and Technology readiness, this study intends to investigate the elements that lead users to receive e-banking, particularly in characteristics of Perceived Usefulness, Technology Readiness, and Self-efficacy. The secondary data of 200 respondents to an online survey distributed to all e-banking customers participated in the research. Following that, SPSS, Tableau, EViews and MS Excel software was leveraged to examine the data.

The study's findings suggest that self-efficacy and technological readiness affect perceived usefulness, and that perceived usefulness and technological readiness positively affect behavioural intention. By contrast, behavioural intention is unaffected by self-efficacy. The results of this study also demonstrate that there is a strong relationship to the degree of user technology adoption when TAM 3 models are integrated with readiness technologists. The self-efficacy variable, however, has negligible effect. This study sheds light on the readiness of consumers to adopt technology in banking, emphasizing the factors influencing their behaviour and readiness. By understanding these dynamics, banks can enhance their e-banking services to meet customer needs effectively and gain a competitive edge in the market.

Keywords: E-Banking, Online banking, Self-Efficacy, Technology Readiness, Technology Acceptance Model, Customers Satisfaction, Behavioural Intention

Introduction

Information systems are essential elements within business organizations (Mulyani et. al., 2016), playing an impactful role in providing insights for decision-making (Ladewi et. al., 2015). Their presence brings benefits like accuracy of information, flexibility, speed integration thereby improving efficiency as well as effectiveness (Edison et. al, 2012). The ongoing advancements in technology are predicted to impact service innovations due to the rapid progress in functionality, connectivity, speed and user-friendliness (Parasuraman et. al., 2015). In the sector of banking, there is a notable adoption of online banking applications, especially electronic banking, which facilitates online access to information and transactions (Mulyani & Rachmawati, 2016).E-banking, including Internet banking, provides various benefits for banks, including reduction of cost, market differentiation, increased sales, streamlined processes, enhanced customer loyalty, expanded reach, and attraction of new customers (Marakarkandy et. al., 2017).

Global bankers predict a shift towards digital channels for banking transactions, emphasizing the significance of perceived convenience and usefulness in technology adoption (Musyaffi & Kayati, 2020; V. Venkatesh & Bala, 2008). However, data shows that in Indonesia, a considerable portion of e-commerce payments still relies on bank transfers, highlighting the challenge of shifting user behavior towards e-banking (Databoks, 2017). Factors such as comfort, safety, and familiarity influence users' preference for traditional banking methods like ATM transactions (Zuhra, 2016). Technology readiness, defined as the psychological state influencing technology adoption, also affects users' behavioral intentions (Basgoze, 2015; Liljander et. al., 2006). Security concerns remain a significant barrier to e-banking adoption, with many users feeling safer with offline transactions (Kaspersky, 2015; Kamaludin, 2018).

Self-efficacy, or faith in one's ability to leverage technology, plays a vital role in technology adoption (Compeau & Higgins, 1995a). Expertise and proficiency in technology additionally boost self-assurance and lessen reluctance towards change (Mulyani & Rachmawati, 2016). Despite the benefits of e-banking, customers still prefer traditional transactions due to perceived safety and the tangible proof provided by receipts (Marketeers, 2016). Addressing these factors is crucial in understanding and promoting e-banking adoption. Integrating the ‘Technology Readiness’.

Literature review

Electronic Banking (E-banking)

Electronic banking, explored by scholars such as Sathye (1999), Gupta & Yadav (2017), and Daniel (1999), is a banking service that employs digital platforms to efficiently provide services and products to customers. According to the Financial Services Authority (2015), it encompasses activities such as accessing information, communication, and conducting transactions through electronic means.

In this study, e-banking includes mobile banking, online banking, text message banking, and telephone banking. The Financial Services Authority lists numerous advantages for clients using e-banking services: 1) Improved convenience regarding time, place, and expenses. 2) Removal of the requirement for in-person visits to banks for details or transactions. 3) Access to round-the-clock trading opportunities through portable devices such as laptops or smartphones for specific items.

Moreover, regulatory bodies highlight additional advantages for both banks and customers adopting e-banking services, promoting a transition towards a cashless society. This transition is characterized by utilizing electronic platforms for transactions, reducing reliance on paper currency (Otoritas Jasa Keuangan, 2015). Furthermore, e-banking facilitates faster payment systems, enhances financial system stability, and mitigates risks associated with crimes such as money laundering and fraudulent activities across various sectors such as taxes, credit cards, insurance, and online purchases.

Technology Readiness (TR)

Technology readiness advocated by Parasuraman (2000), pertains to assessing individuals' readiness to embrace new technology. Stemming from the understanding that people find it challenging to adapt to new innovations, technology readiness has garnered significant attention in research, particularly concerning user acceptance. Numerous studies (Parasuraman, 2000; Walczuch, Lemmink, & Streukens, 2007; Sripalawat, Thongmak, & Ngramyarn, 2011; Parasuraman & Colby, 2015; Basgoze, 2015) have delved into measuring and understanding technology readiness. The latest iteration, Technology Readiness 2 (TR2), as developed by Parasuraman and Colby (2015), categorizes triggers of technology readiness into its different drivers (such as innovation and optimism) and threat factors (like discomfort and insecurity). For optimistic and innovative individuals, technology signifies progress, while pragmatic individuals view it skeptically until they gain sufficient confidence. Technology readiness represents a mental state enabling individuals to adopt new technology, characterized by their inclination to accept and utilize it (Melas, Zampetakis, Dimopoulou, & Moustakis, 2014). Liljander et al. (2006), described it as a psychological state influenced by both positive expectations and barriers, guiding an individual's technology usage. Hence, readiness for technologies embodies an individual's preparedness to utilize E-banking technology to accomplish their objectives.

Self-Efficacy (SE)

Self-Efficacy indicates the significance of an individual in their skills, abilities or knowledge required for a particular activity (Luarn & Lin, 2005), an aspect rooted in social cognitive theory of Bandura, which highlights the interplay of behavior, environment, and people as influencing factors (Wood & Bandura, 1989). It encompasses the capacity to think critically, problem-solve, and navigate challenges, serving as a measure of human resourcefulness (Ramos et. al., 2018). Described by Luarn et. al., (2005) as a belief in one's capabilities and aptitudes, self-efficacy evolves with exposure to information and experiences explained by Marakarkandy et al., (2017).

Wood & Bandura (1989) explains self-efficacy as the ability to manage motivation, cognitive resources, and actions necessary for coping with environmental stressors. It also encompasses personal emotions and behaviors in self-regulation and contentment (W.T. Chen et al., 2013). Wang, Wang, & Wei (2014) assert that self-efficacy influences individuals' readiness to adopt technology, while Schwarzer, Antoniuk, & Gholami (2015) emphasize its role in accessing information and services through technology.

Boonsiritomachai & Pitchayadejanant (2017) characterize self-efficacy as one's confidence in using e-banking, particularly regarding knowledge and control over e-banking functions (Singh & Srivastava, 2018). Considered crucial in the examination of individual behavior, particularly within the domain of information technology (Compeau &

Higgins, 1995b; Agarwal & Prasad, 1997), self-efficacy refers to an individual's self-assessment of their proficiency in comprehending and utilizing e-banking services (Boonsiritomachai & Pitchayadejanant, 2017; Bandura, 1986; Luarn & Lin, 2005; Compeau & Higgins, 1995b; Marakarkandy et al., 2017; Ramos et al., 2018; Schwarzer et al., 2015; Singh & Srivastava, 2018; V. Venkatesh et al., 2003; Y.-S. Wang et al., 2003). This concept spans various modalities such as mobile banking, online banking, including SMS banking and phone banking.

Perceived Usefulness (PU)

According to the technology acceptance model, the factors influencing behavioral objectives are perceived usefulness and perceived ease of use. Perceived ease of use refers to users' belief that utilizing technology requires less effort compared to abstaining from it. Perceived usefulness pertains to an individual's perception of technology's capacity to enhance goal achievement. It can be understood as the benefits users anticipate from a technology or the level of benefit experienced in its use. When technology provides sufficient convenience, it reduces the effort and costs associated with learning and utilizing it. Davis further posits that perceived usefulness reflects users' faith in improved performance with information systems. Greater ease of use of technology increases the likelihood of its adoption. In the context of e-banking, higher perceived usefulness of mobile banking correlates with greater acceptance of the technology. Thus, perceived usefulness reflects individuals' assessment and confidence that e-banking will enhance their performance compared to traditional methods.

Behavioral Intention

In previous studies on technology acceptance, behavioral intention has been defined as an individual's decision to utilize technology. It has consistently been a key factor in the development of technology acceptance models. For instance, the ‘Theory of Reasoned Action’, initially formulated by Ajzen and Fishbein, was later adapted by Davis into the Technology Acceptance Model, which further evolved into TAM 3. Behavioral intention signifies a person's readiness to engage in specific behaviors and is continuous. It represents an individual's willingness to undertake everyday actions. Intention, according to Bamberg et al., refers to a person's inclination to exhibit or refrain from future behaviors. It indicates the individual's intention to engage in appropriate actions voluntarily.

Vandana T. Khanna and Neha Gupta (2015) found that factors like how willing people are to use technology, how safe they feel using it, how easily they can access it, and how user-friendly it is, often vary based on the characteristics of the customers, such as their age, income, and education level. These factors play a significant role in the decisions made by banks to improve their services through different channels.

As customers are becoming more familiar with new technologies, banks, especially those in the public sector, should consider offering additional services that make it easier for customers to access information with fewer steps or clicks. This way, they can cater to the preferences of their customers and provide more value-added services that meet their needs effectively.

Safeena et al. (2010) investigated how customers view the adoption of internet banking. Their study revealed that factors such as how useful customers perceive online banking to be, how easy they find it to use, their awareness of online banking services, and their perception of the risks involved, are crucial in determining whether customers will adopt online banking. These factors have a significant and positive impact on customers' willingness to accept and use online banking systems.

Research Objectives

1. To analyse various factors affecting consumer technology readiness for e-banking.
2. To assess the relationship between consumer behaviour and technology readiness and their impact on the adoption and usage of e-banking services.
3. To investigate the various dimensions of consumer behaviour relevant to e-banking adoption and its perceived usefulness.

Research Methodology

The research methodology for the study on technology readiness and consumer behavior in e-banking was carefully designed to ensure accuracy and reliability of the findings. Each respondent's technology readiness was assessed using a subset of 23 contents from the 36-contents scale recommended by Parasuraman and Colby (2002), focusing on dimensions such as Innovativeness, Optimism, Discomfort, and Insecurity. Prior to the main study, a pilot study was conducted with 10 sample customers to validate the questionnaire, ensuring its effectiveness and relevance.

Reliability analysis, following the guidelines of Paul-Peter (1979) and supported by Hair et al. (2006), was employed using Cronbach's alpha coefficient. This measure, ranging from 0 to 1, evaluated the internal consistency of the entire scale, with a resulting coefficient of 0.763 indicating a high level of reliability in the Technology Readiness Index (TRI).

Richard Shambre (2013) highlighted that customers with higher levels of technological readiness are more prone to using technology more frequently and regularly. This indicates a strong correlation between technology usage and readiness. Furthermore, those with increased technological readiness are more inclined to adopt and utilize a diverse range of technologies in their interactions and transactions.

Secondary data were sourced from the research paper authored by Dr. G. Shoba, Associate Professor at the Department of Master of Business Administration, Priyadarshini Engineering College, Vaniyambadi, India. This included data from journals, books, reports, and the internet, providing a comprehensive foundation for the study.

Convenience sampling was utilized to select a sample size of 200 respondents, with another secondary data of 100 respondents chosen for its balance of practicality and statistical relevance. The nature of the research was categorized

as exploratory and descriptive, aiming to explore new areas while describing the characteristics of technology readiness and consumer behavior in e-banking.

The data analysis was performed utilizing software such as SPSS, Tableau, EViews, and Microsoft Excel, enabling a comprehensive investigation and understanding of the data. Various statistical methods including mean analysis, factor analysis, cluster analysis, chi-square analysis, and regression analysis were utilized to scrutinize the gathered data. Mean analysis allowed for the determination of average values for each aspect, while factor analysis unveiled hidden factors within the data. Cluster analysis was employed to group participants based on similarities, and chi-square analysis was used to explore relationships between categorical variables. Lastly, regression analysis was utilized to evaluate the influence of independent variables on the dependent variable.

These insights provide a nuanced understanding of the demographic and preference landscape of e-banking users, offering valuable considerations for service providers and policymakers in this sector.

The methodology used in this study was systematic and rigorous, ensuring the validity and reliability of findings. By employing established scales, conducting pilot testing, and using various statistical techniques like mean analysis and regression analysis, the study aimed to provide valuable insights into technology readiness and its impact on consumer behavior in the e-banking sector. This approach allowed for a comprehensive examination, enhancing the credibility of the research outcomes.

Hypothesis

H_{01} – There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Education.

H_{02} – There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Gender.

H_{03} – There is no significant relation between Attributes, Computer usage level, and Mode of Banking towards customer satisfaction level on technology.

Tools for Analysis

Customer data was analyzed with percentages, means, standard deviations, ANOVA, Chi-Square, and Unit Root Test to uncover insights and to assess the proposed objectives.

Fig. 1

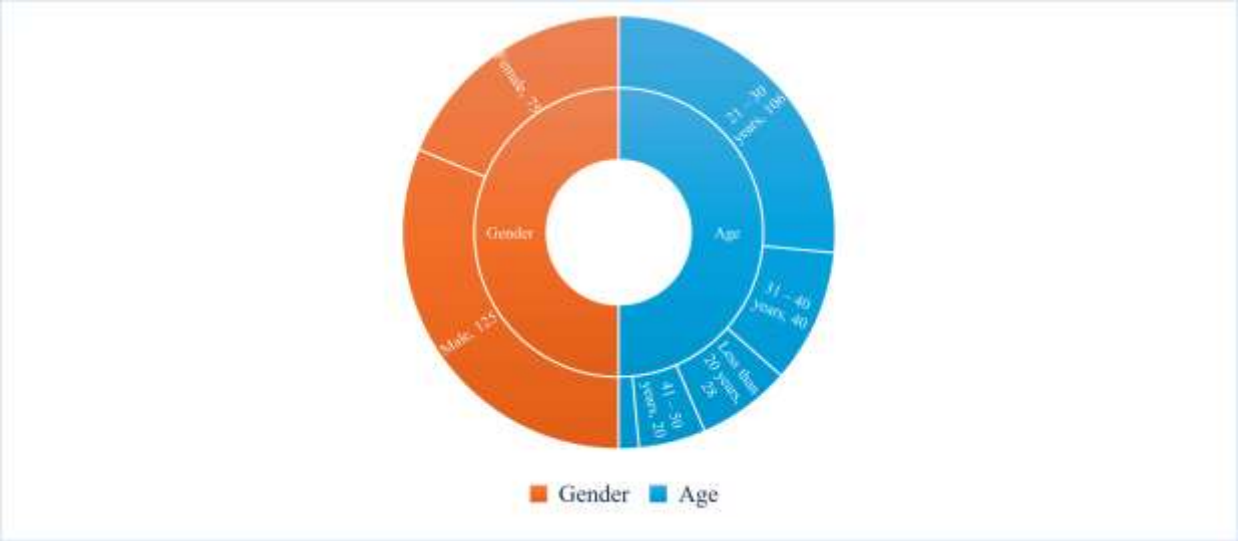

Table: 1

Frequency of Gender and Age of the respondents

Gender	Male	125
	Female	75
Age	Less than 20 years	28
	21 – 30 years	106
	31 – 40 years	40
	41 – 50 years	20
	Above 50 years	6

The provided data offers insights into various aspects of a survey conducted among respondents, focusing on their demographics, educational qualifications, employment status, income levels, marital status, banking habits, and computer usage levels.

In terms of gender distribution, the survey encompassed 200 individuals, with 125 males and 75 females participating. This shows a higher representation of males in the survey sample. When considering age groups, the majority of respondents fall within the 21 to 30 years category, comprising 106 individuals. Following this, the 31 to 40 years group consists of 40 respondents, while the 41 to 50 year and above 50 years groups have 20 and 6 participants respectively. The youngest age group, less than 20 years, includes 28 respondents.

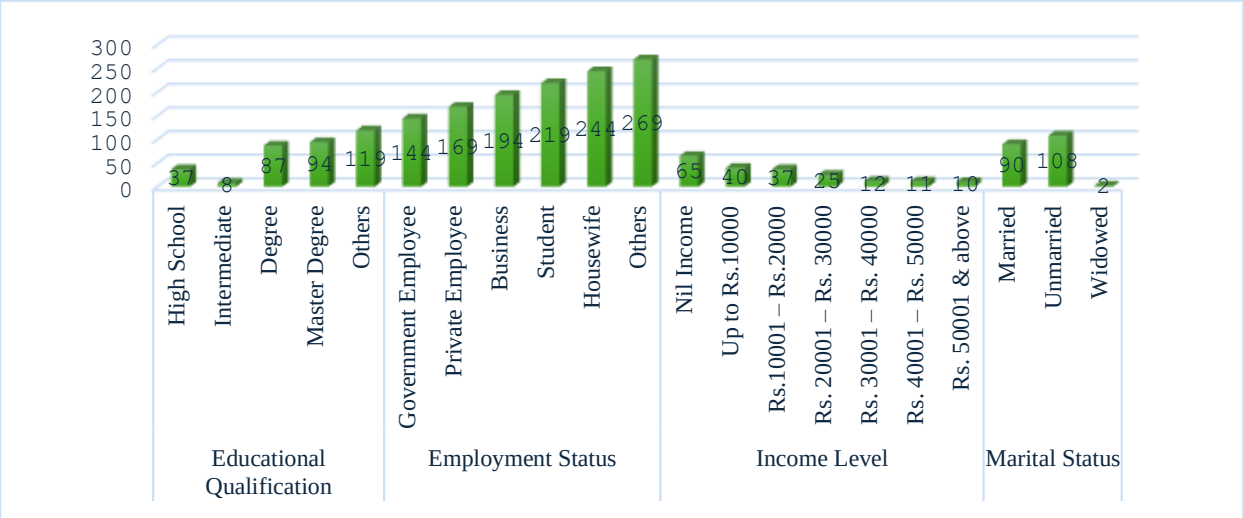

Fig. 2

Table: 2

Frequency of Educational Qualification, Employment Status, Income Level & Marital Status

Educational Qualification	High School	37
	Intermediate	8
	Degree	87
	Master's degree	94
	Others	119
Employment Status	Government Employee	144
	Private Employee	169
	Business	194
	Student	219
	Housewife	244
	Others	269
Income Level	Nil Income	65
	Up to Rs.10000	40
	Rs.10001 – Rs.20000	37
	Rs. 20001 – Rs. 30000	25
	Rs. 30001 – Rs. 40000	12
	Rs. 40001 – Rs. 50000	11
	Rs. 50001 & above	10
Marital Status	Married	90
	Unmarried	108
	Widowed	2

Moving on to educational qualifications, the respondents exhibit a diverse range, with the highest frequency being "Others" at 119, indicating various educational backgrounds not specifically categorized. This is followed by master's degree holders with 94 respondents, and then Degree holders with 87. High School and Intermediate qualifications have lower frequencies at 37 and 8 respectively.

Employment status sheds light on the diverse occupational profiles within the sample. The highest frequency is seen among Housewives with 244 respondents, followed closely by Students with 219. Businesspersons make up 194 of the sample, while Private and Government Employees are represented by 169 and 144 individuals respectively. The category "Others" includes 269 respondents, showcasing a broad range of employment statuses.

In terms of income levels, a substantial portion of the respondents fall under the "Nil Income" category, with 65 individuals. The next highest frequency is "Up to Rs.10000" with 40 respondents, followed by "Rs.10001 – Rs.20000" and "Rs. 20001 – Rs. 30000" with 37 and 25 respectively. The highest income category, "Rs. 50001 & above," includes 10 respondents.

Marital status shows a balanced distribution, with 90 respondents identifying as Married and 108 as Unmarried. A small number of 2 respondents are identified as Widowed.

Fig. 3

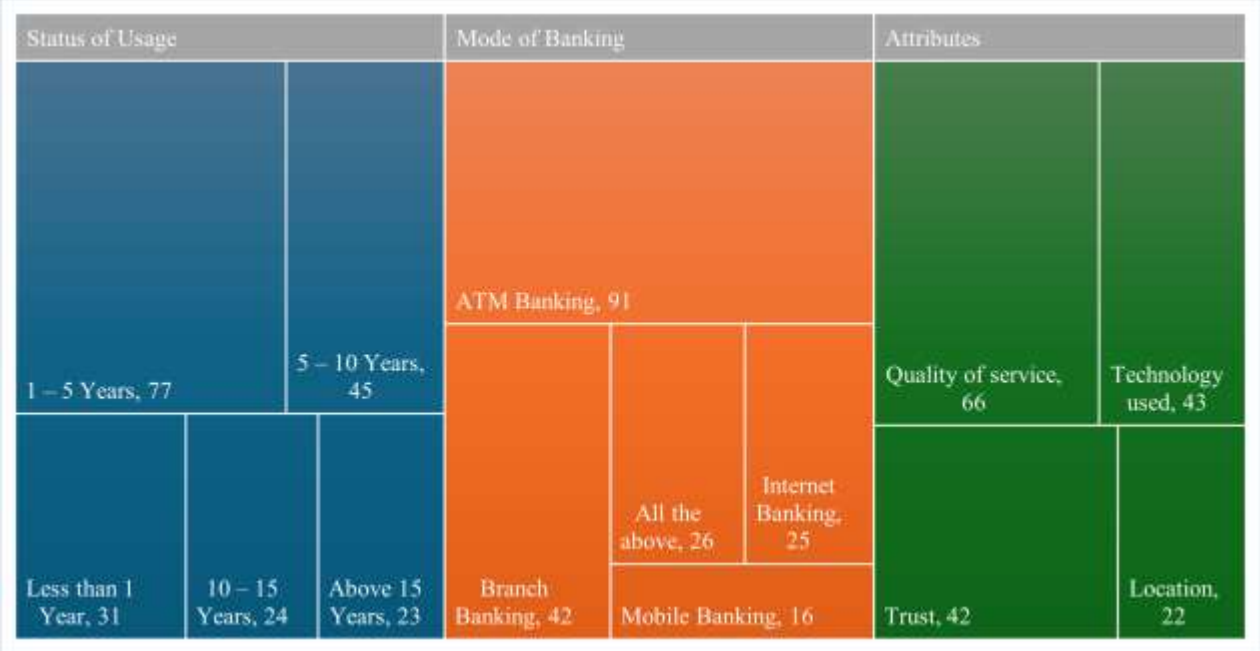

Table: 3

Frequency of Status of Usage, Mode of Banking & attributes

Status of Usage	Less than 1 Year	31
	1 – 5 Years	77
	1 – 5 Years	77
	5 – 10 Years	45
	10 – 15 Years	24
	Above 15 Years	23
Mode of Banking	Branch Banking	42
	ATM Banking	91
	Mobile Banking	16
	Internet Banking	25
	All the above	26
Attributes	Quality of service	66
	Technology used	43
	Trust	42
	Location	22

Turning to banking habits, the data provides insights into the status of usage and modes preferred by respondents. Most respondents have been using banking services for 1 to 5 years, with 77 individuals falling into this category. This is followed by "5 – 10 Years" and "Less than 1 Year" with 45 and 31 respondents respectively. The mode of banking preferred by most is ATM Banking, with 91 respondents, followed by Branch Banking with 42, Internet Banking with 25, and Mobile Banking with 16. A notable portion of 26 respondents use all the mentioned modes.

Fig. 4

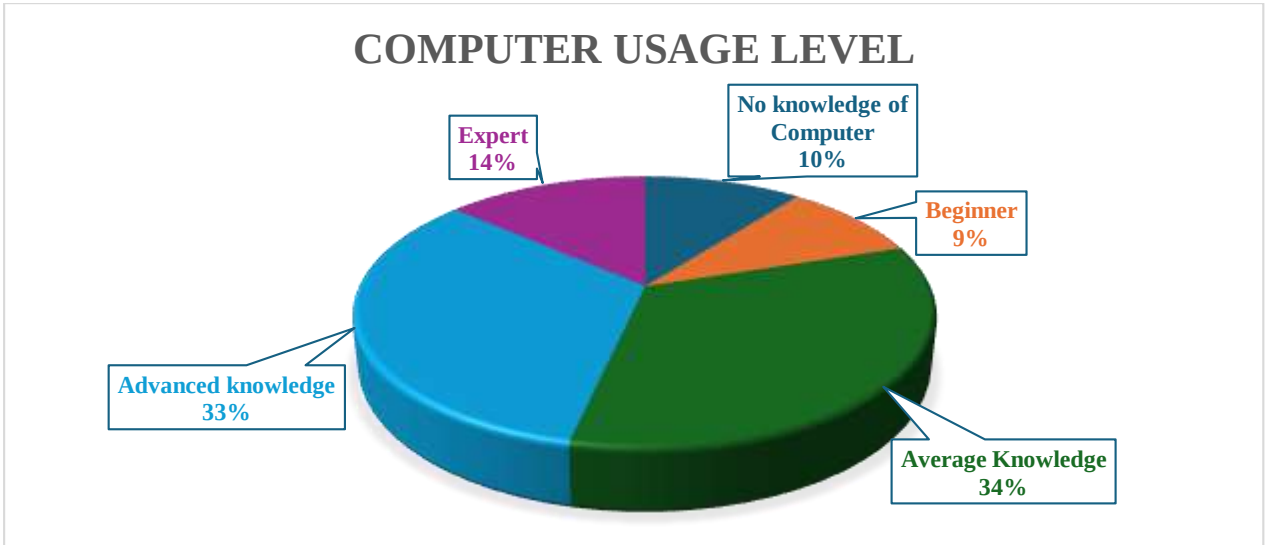

Table: 4

Frequency of Computer Usage Level

Computer Usage Level	No knowledge of Computer	21
	Beginner	19
	Average Knowledge	67
	Advanced knowledge	66
	Expert	27

Lastly, the data includes the frequency of computer usage levels among respondents. The largest group consists of those with "Average Knowledge" at 67 individuals, followed by "Advanced Knowledge" with 66. The “No Knowledge of Computer" and "Beginner" categories have 21 and 19 respondents respectively, while the "Expert" category has 27 individuals.

This data paints a picture of a diverse group of respondents with varied demographics, educational backgrounds, employment statuses, income levels, banking habits, and computer usage levels. The findings can be valuable for businesses and policymakers aiming to understand and cater to the needs and preferences of different segments within the population.

Table: 5

Descriptive Analysis of Technology Readiness

Statement	**Mean**	**Standard Deviation**
1. I prefer the most advanced technology available.	3.93	1.175
2. Technology makes me more efficient in my job.	3.96	1.090
3. I find new technologies to be mentally stimulating.	3.46	1.181
4. Technology gives me the freedom of mobility.	3.88	0.995
5. I feel confident that machines will do what you tell them to do.	3.71	1.087
6. I am the first in my friend’s circle to adopt the new technology.	3.31	1.350
7. I keep up with the latest technological developments in banking technologies.	3.79	1.099

8. Banking products and services that use the latest technology are much more convenient to use.	4.30	0.743
9. I like the idea of banking via computers/internet because I am not limited to regular business hours.	3.70	1.235
10. I find I have fewer problems than other people in making technology work for me.	3.64	1.124
11. Technical support lines are not helpful because they don't explain things in terms that I understand.	2.46	1.459
12. I think that technology systems are not designed for use by ordinary people.	3.33	1.400
13. The manuals and instructions for this service are not written in plain language.	3.34	1.331
14. If I buy a high-tech product or service, I prefer to have the basic model rather than one with a lot of extra features.	2.71	1.586
15. It is embarrassing when I have trouble with a high-tech gadget while people are watching.	3.31	1.180
16. Many new technologies have safety risks that are not discovered until after people have used them.	3.41	1.023
17. Technology always seems to fail at the worst possible time.	3.19	1.290
18. I do not think it is safe to do any kind of financial business online.	2.80	1.542
19. I do not feel confident transacting with a place that can only be reached online.	2.92	1.452
20. Whenever something gets automated, you need to check carefully that the machine or computer is not making mistakes.	3.20	1.454
21. The human touch is very important when I do banking.	3.46	1.099
22. When I call a bank, I prefer to talk to a person rather than a machine.	3.41	1.318
23. If I am providing information to a machine or over the internet, I am never sure it really gets to the right place.	3.08	1.118

The data in the table indicates how customers feel about technology in the realm of e-banking. These 23 statements, answered on a scale from "Strongly Disagree" to "Strongly Agree," were designed to capture customer attitudes on various aspects of technology readiness and behavior when it comes to banking online. Parasuraman's (2000) Technology Readiness Index (TRI) provides a framework to understand these dimensions, such as Optimism, Innovativeness, Discomfort, and Insecurity.

The findings suggest that customers strongly agree (mean score of 4.30) that modern technology in banking makes services much more convenient. This positive sentiment reflects optimism (one of the TRI dimensions) about the benefits and ease of using advanced technology for banking tasks. Additionally, the fact that this statement had a low standard deviation (0.743) indicates that many customers share this view consistently. attitudes towards technology in banking reveal a mixed perspective among respondents. While most prefer advanced technology and acknowledge its efficiency (Mean: 3.93 and 3.96), concerns arise about complexity and usability (Mean: 3.46 and 3.33). There's notable skepticism regarding online banking security (Mean: 2.92 and 2.80), yet a preference for human interaction persists (Mean: 3.46 and 3.41). These results emphasize the need for banks to balance technological advancements with user-friendly interfaces and enhanced security, while preserving avenues for personalized service to meet diverse customer expectations in e-banking.

However, another finding was that customers are less satisfied (mean score of 2.46) with the explanations provided by technical support lines. This suggests some discomfort (another TRI dimension) with the assistance customers receive when they have tech-related issues. The wider range of responses, as shown by the higher standard deviation (1.459), suggests that opinions on this topic vary more among customers.

The data tells us that customers generally see the advantages of modern technology in banking, finding it convenient and beneficial. On the flip side, there are concerns about the effectiveness of technical support, indicating that some customers feel they aren't getting the help they need when facing technology-related problems. These insights underline the importance of improving technical support services to match customers' expectations and the adoption of e-banking solutions.

Table: 6

Level of Awareness towards Technology

ANOVA - "Level of Awareness towards Technology":										
Source	N	Mean	Std. Deviation	Std. Error		Sum of Squares	df	Mean Square	F	Sig.
High School	3	3.7222	0.25459	0.14699	Between Groups	1.627	2	0.814	1.144	0.323
Graduation	47	4.0709	0.8872	0.12941	Within Groups	68.983	97	0.711		
Post Graduation	50	4.2767	0.81623	0.11543	Total	70.61	99	-		
Total	100	4.1633	0.84453	0.08445				-		

H_{01}

There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Education.

The ANOVA results for the "Level of Awareness towards Technology" reflect the mean score for respondents with a High School education was 3.7222, while those with a Graduation degree had a mean score of 4.0709, and respondents with a Post Graduation degree had the highest mean score of 4.2767. This indicates a trend of increasing awareness towards technology with higher educational attainment. However, the ANOVA test yielded a non-significant p-value of 0.323, suggesting that the differences observed in mean scores could have occurred due to random chance rather than actual differences in awareness levels among the educational groups. The Standard Deviation values show the variability of responses within each group, with High School graduates having the lowest variability (0.25459) and Graduation degree holders having the highest (0.8872). Overall, while there appears to be a trend of increasing awareness towards technology with higher education. Hence null Hypothesis accepted, the non-significant p-value indicates that these differences are not statistically significant.

Table: 7

Level of Perception on Technology

ANOVA - "Level of Perception on Technology":										
Source	N	Mean	Std. Deviation	Std. Error		Sum of Squares	df	Mean Square	F	Sig.
High School	3	4.3333	0.57735	0.33333	Between Groups	0.922	2	0.461	0.72	0.489
Graduation	47	3.805	0.75527	0.11017	Within Groups	62.078	97	0.64		
Post Graduation	50	3.7633	0.84722	0.11982	Total	63	99	-		
Total	100	3.8	0.79772	0.07977				-		

H_{01}

There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Education.

The ANOVA results for "Level of Perception on Technology" reveal interesting insights into how different levels of education relate to perceptions of technology. The mean scores for respondents with a High School education, Graduation degree, and Post Graduation degree were 4.3333, 3.805, and 3.7633 respectively. It appears that individuals with a High School education have the highest mean perception score, followed by Graduation degree holders and then Post Graduation degree holders. However, the ANOVA test yielded a non-significant p-value of 0.489, indicating that these differences in mean scores could have occurred by random chance rather than being significant. The Standard Deviation values within each group also provide insights into the variability of responses, with High School graduates having a lower variability (0.57735) compared to Graduation degree holders (0.75527) and Post Graduation degree holders (0.84722). While there seems to be a slight trend of decreasing perception scores with higher education levels, the non-significant p-value suggests that these differences are not statistically significant.

Table: 8

Efficiency of Service

ANOVA "Efficiency of Service":										
Source	N	Mean	Std. Deviation	Std. Error		Sum of Squares	df	Mean Square	F	Sig.
High School	3	4	0	0	Between Groups	0.046	2	0.023	0.019	0.981
Graduation	47	3.9096	0.914	0.13332	Within Groups	116.704	97	1.203		
Post Graduation	50	3.885	1.26391	0.17874	Total	116.75	99	-		
Total	100	3.9	1.08595	0.1086				-		

H_{01}

There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Education.

The ANOVA results for "Efficiency of Service" provide insights into how different educational levels relate to perceptions of service efficiency. The mean scores for respondents with a High School education, Graduation degree, and Post Graduation degree were 4, 3.9096, and 3.885 respectively. It appears that individuals with a High School education have the highest mean score, followed closely by Graduation degree holders and then Post Graduation degree holders. The Standard Deviation values within each group also reveal the variability of responses, with High School graduates having the least variability (0) as all responses had the same mean, while Graduation degree holders had a higher variability (0.914), and Post Graduation degree holders had the highest variability (1.26391). However, the ANOVA test resulted in a non-significant p-value of 0.981. Hence null hypothesis is accepted, indicating that these differences in mean scores could have occurred by random chance rather than being significant.

Table: 9

Customer Satisfaction with Demographic Feature Gender

Customer Satisfaction with Demographic Feature Gender:							
Gender	Customer Service	Extremely Dissatisfied	Dissatisfied	Neutral	Satisfied	Extremely Satisfied	Total
Male	Count	2	7	24	21	8	62
	%	3.20%	11.30%	38.70%	33.90%	12.90%	100.00%
Female	Count	0	2	10	21	5	38
	%	0.00%	5.30%	26.30%	55.30%	13.20%	100.00%
Total	Count	2	9	34	42	13	100
	%	2.00%	9.00%	34.00%	42.00%	13.00%	100.00%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.809	4	0.214

H_{02}

There is no significant mean difference in level of awareness, level of perception, and efficiency of service towards technology for variable Gender.

The table presents customer satisfaction levels categorized by gender. Among male customers, 3.20% were extremely dissatisfied, 11.30% were dissatisfied, 38.70% were neutral, 33.90% were satisfied, and 12.90% were extremely satisfied. On the other hand, female customers had 0.00% who were extremely dissatisfied, 5.30% dissatisfied, 26.30% neutral, 55.30% satisfied, and 13.20% extremely satisfied. Overall, 2.00% of all customers were extremely dissatisfied, 9.00% were dissatisfied, 34.00% were neutral, 42.00% were satisfied, and 13.00% were extremely satisfied. The Pearson Chi-Square test with a value of 5.809 and 4 degrees of freedom resulted in a p-value of 0.214. This p-value indicates that there is no significant association between customer satisfaction levels and gender at a 95% confidence level ($\alpha = 0.05$). This suggests that gender has no significant influence on customer satisfaction levels in this context.

Table: 10

Unit Root Test for Attributes

Null Hypothesis: FREQUENCY_OF__ATTRIBUTES has a unit root Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic Test		-0.703135	0.6864
critical values:	1% level	-8.033476	
	5% level	-4.541245	
	10% level	-3.380555	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FREQUENCY_OF__ATTRIBUTES) Method: Least Squares
Date: 04/09/24 Time: 01:48 Sample (adjusted): 2 4
Included observations: 200 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FREQUENCY_OF__ATTRIBUTES(-1)	-0.505425	0.718817	-0.703135	0.6099
C	10.77306	37.04755	0.290790	0.8198

R-squared	0.330834	Mean dependent var	-14.66667
Adjusted R-squared	-0.338331	S.D. dependent var	11.93035
S.E. of regression Sum	13.80178	Akaike info criterion	8.322193
squared resid Log likelihood	190.4892	Schwarz criterion	7.721268
F-statistic Prob(F-	-10.48329	Hannan-Quinn criter.	7.114257
statistic)	0.494398	Durbin-Watson stat	2.562387
	0.609862		

H_{03}

There is no significant relation between Attributes, Computer usage level, and Mode of Banking towards customer satisfaction level on technology.

The null hypothesis states that 'Frequency of attributes has a unit root, which suggests the variable is non-stationary. The Augmented Dickey-Fuller test statistic resulted in a value of -0.703135, with critical values of -8.033476 (1% level), -4.541245 (5% level), and -3.380555 (10% level). The corresponding p-value is 0.6864, which is greater than the common significance levels (1%, 5%, 10%).

We fail to reject the null hypothesis. This implies that there is evidence to suggest that 'Frequency of Attributes' contains a unit root, indicating it is non-stationary. The regression equation for the Augmented Dickey-Fuller test shows the coefficient of the lagged variable (-1) as -0.505425, with a standard error of 10.77306 and a t-statistic of -0.703135. The R-squared value is 0.330834, suggesting that around 33% of the variation in the variable can be explained by its lagged value.

Table: 11

Unit Root Test for Computer Usage Level

Null Hypothesis: FREQUENCY_OF_COMPUTER_USAGE_LEVEL has a unit root Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic Test		-1.409835	0.4711
critical values:	1% level	-6.423637	
	5% level	-3.984991	
	10% level	-3.120686	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FREQUENCY_OF_COMPUTER_USAGE_LEVE L)
Method: Least Squares Date: 04/09/24
Time: 01:49 Sample (adjusted): 2 5
Included observations: 200 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FREQUENCY_OF_COMPUTER_USAGE C	-0.937984	0.665314	-1.409835	0.2940
	42.06779	32.67331	1.287528	0.3268

R-squared	0.498450	Mean dependent var	1.500000
Adjusted R-squared	0.247674	S.D. dependent var	35.68847
S.E. of regression Sum	30.95500	Akaike info criterion	10.00980
squared resid Log	1916.424	Schwarz criterion	9.702946
likelihood	-18.01960	Hannan-Quinn criter.	9.336433
F-statistic Prob(F-statistic)	1.987635	Durbin-Watson stat	2.007856
	0.293990		

H_{03}

There is no significant relation between Attributes, Computer usage level, and Mode of Banking towards customer satisfaction level on technology.

The null hypothesis states that 'Frequency of computer usage level' possesses a unit root, indicating it is non-stationary. The Augmented Dickey-Fuller test statistic yielded a value of -1.409835, with corresponding critical values of -6.423637 (1% level), -3.984991 (5% level), and -3.120686 (10% level). The associated p-value is 0.4711, which exceeds common significance thresholds (1%, 5%, 10%).

As a result, Null hypothesis is accepted, indicating that there is evidence to suggest 'Frequency of computer usage level' contains a unit root and is thus non-stationary. Looking at the regression equation for the Augmented Dickey-Fuller test, the coefficient of the constant term is -0.937984, with a standard error of 42.06779 and a t-statistic of -1.409835. The R-squared value is 0.498450, suggesting that approximately 50% of the variation in the variable can be explained by the model.

Table:12

Unit Root Test for Mode of Banking

Null Hypothesis: FREQUENCY_OF_MODE_OF_BANKING has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic Test		-1.607920	0.3987
critical values:	1% level	-6.423637	
	5% level	-3.984991	
	10% level	-3.120686	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FREQUENCY_OF_MODE_OF_BANKING) Method: Least Squares
Date: 04/09/24 Time: 01:50 Sample (adjusted): 2 5
Included observations: 200 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FREQUENCY_OF_MODE_OF_BANKING(C	-1.162347	0.722889	-1.607920	0.2491
	46.56211	37.78087	1.232426	0.3430

R-squared	0.563834	Mean dependent var	-4.000000
Adjusted R-squared	0.345751	S.D. dependent var	51.78159
S.E. of regression Sum	41.88389	Akaike info criterion	10.61453
squared resid Log	3508.521	Schwarz criterion	10.30768
likelihood	-19.22906	Hannan-Quinn criter.	9.941167
F-statistic Prob(F-statistic)	2.585408	Durbin-Watson stat	1.285777
	0.249111		

H_{03}

There is no significant relation between Attributes, Computer usage level, and Mode of Banking towards customer satisfaction level on technology.

The Unit Root Test for 'Frequency of mode of banking' was conducted using the Augmented Dickey-Fuller test, with the null hypothesis stating that the variable has a unit root. The test statistic obtained was -1.607920, with critical values at -6.423637 (1% level), -3.984991 (5% level), and -3.120686 (10% level). The p-value associated with the test statistic was 0.3987, indicating insufficient evidence to reject the null hypothesis.

The regression analysis for 'Frequency of mode of banking' yielded a coefficient of -1.162347 with a standard error of 46.56211 and a t-statistic of -1.607920. The associated p-value was 0.2491, suggesting that the coefficient is not statistically significant.

Considering the hypothesis *H_{03}*, which states "There is no significant relation between Attributes, Computer usage level, and Mode of Banking towards customer satisfaction level on technology," the analysis does not provide significant evidence to reject this null hypothesis. This implies that, based on the data and analysis conducted, there is

no significant relationship found between the mentioned variables and customer satisfaction level on technology, specifically in the context of mode of banking.

Table: 13

Anova (Cluster)

Cluster	F Value	Between Groups df	Between Groups Mean Square	Within Groups df	Within Groups Mean Square	Significance (Sig.)
Innovativeness	47.121	2	0.424	197	111.23	0
Optimism	29.959	2	0.335	197	89.45	0
Discomfort	43.4	2	0.442	197	98.08	0
Insecurity	66.484	2	0.399	197	166.44	0

The table presents the results of the ANOVA tests for different clusters: Innovativeness, Optimism, Discomfort, and Insecurity. F value represents the ratio of the variance among group means to the variance within the groups in each cluster. For Innovativeness, the F value is 47.121, indicating that there is a significant difference in means between the groups. The Between Groups df (degrees of freedom) is 2, representing the number of groups minus 1. The Between Groups Mean Square is 0.424, which is the average variance between groups. The Within Groups df is 197, representing the number of groups subtracted from the total number of observations. The Within Groups Mean Square is 111.23, indicating the average variance within the groups. The significance (Sig.) values for all clusters are 0, suggesting that the differences in means among the clusters are statistically significant.

Similarly, for Optimism, Discomfort, and Insecurity, the F values are 29.959, 43.4, and 66.484 respectively, all with a '0' significance. These results indicate that there are significant differences in means among the clusters for these dimensions as well. Overall, these findings suggest that there are distinct differences in the levels of Innovativeness, Optimism, Discomfort, and Insecurity among the respondents, as indicated by their scores on the respective clusters.

Findings

- ✓ Education does not significantly affect technology awareness for e-banking, but higher education levels correlate with increased awareness.
- ✓ Gender is not a determining factor in customer satisfaction with e-banking services.
- ✓ Attributes like computer usage and mode of banking do not have a direct impact on satisfaction levels.
- ✓ The Technology Readiness Index (TRI) indicates a generally positive attitude towards modern banking technology, but there are areas for improvement, notably in technical support explanations.

- ✓ Cluster analysis reveals diverse customer attitudes towards technology readiness, suggesting a varied customer base.
- ✓ Overall, customers show satisfaction with the convenience of modern banking technology but express dissatisfaction with technical support explanations.

Conclusion

The study, titled "A Multi-Dimensional Comparative Analysis of Consumer Behavior and Technology Readiness for E-Banking," delved into various facets of consumer behavior and technology readiness in the e-banking sector. Through meticulous methodology and robust data analysis, valuable insights have emerged.

Firstly, the descriptive analysis of technology readiness provided a nuanced understanding of customer attitudes towards modern technology in banking. For instance, the mean score of 4.30 indicated that customers strongly agree that modern technology makes banking services much more convenient. This positive sentiment reflects optimism about the benefits of advanced technology in banking tasks.

However, concerns were raised regarding technical support effectiveness, as indicated by the lower mean score of 2.46. This suggests that some customers feel dissatisfied with the explanations provided by technical support lines, highlighting an area for improvement in customer service.

ANOVA tests explored the relationship between education levels and technology awareness, perception, and service efficiency. While there was a trend of increasing awareness towards technology with higher educational attainment, the tests revealed non-significant differences among educational groups. For example, the ANOVA results for "Level of Awareness towards Technology" showed mean scores of 3.7222 for High School, 4.0709 for Graduation, and 4.2767 for Post Graduation. Despite these differences, the p-value of 0.323 indicated that these variations could have occurred due to random chance rather than actual differences in awareness levels.

Customer satisfaction analysis by gender also yielded interesting insights. The Pearson Chi-Square test showed no significant association between gender and customer satisfaction levels. This was demonstrated through customer satisfaction percentages: 3.20% extremely dissatisfied, 11.30% dissatisfied, 38.70% neutral, 33.90% satisfied, and 12.90% extremely satisfied for males, and 0.00%, 5.30%, 26.30%, 55.30%, and 13.20% respectively for females. The resulting p-value of 0.214 indicated that gender does not significantly influence customer satisfaction levels.

Furthermore, unit root tests for attributes, computer usage level, and mode of banking indicated non-stationarity in these variables. This suggests that these variables exhibit trends rather than random fluctuations, providing a deeper understanding of how these factors impact customer behavior in e-banking.

In conclusion, the study's findings offer valuable insights for e-banking service providers and policymakers. The positive sentiment towards technology's convenience in banking is clear, yet there are opportunities to enhance technical support services. Additionally, the study highlights the need for tailored approaches in addressing customer needs, as demonstrated by the non-significant differences based on education and gender. Policymakers and service providers

can leverage these insights to refine their strategies and offerings, ultimately improving customer satisfaction and adoption of e-banking solutions.

Future scope of the study

- ✓ Investigating the impact of emerging technologies such as blockchain, AI, and biometrics on e-banking adoption and customer behavior.
- ✓ Conducting comparative studies across different e-banking platforms to identify best practices for customer satisfaction and service delivery.
- ✓ Examining the role of financial literacy and education programs in promoting e-banking adoption among diverse demographic groups.
- ✓ Examining the influence of cultural factors and geographical location on e-banking adoption and satisfaction.
- ✓ Assessing the potential of gamification and interactive features in e-banking platforms to enhance user engagement and satisfaction.
- ✓ Investigating the effects of social media and peer influence on e-banking decisions and behaviors.

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