

Research Article

Impact of Electronic Services on Customer Satisfaction: The Case of Commercial Bank in Urban Area of Nepal

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Abstract

Electronic banking (e-banking) plays a crucial role in service delivery for emerging economies like Nepal, yet its effects on customer satisfaction remain uneven and context of dependent. It investigates the influence of major e-banking services are ATMs, internet banking, mobile banking, debit cards, credit cards, and electronic fund transfers on the satisfaction levels among customers of commercial banks in urban areas. This paper based on a descriptive research design, selected respondents 188 bank customers in the Kathmandu Valley by using structured questionnaires to collect their experiences and perceptions. Data analysis drew on descriptive statistics to outline usage patterns, Pearson correlations to examine relationships between variables, and multiple regression to assess predictive impacts while controlling confounding factors. The research findings reveal that ATMs and debit cards exert a significant positive effect on customer satisfaction, likely due to their reliability, accessibility, and ease of use in daily transactions. In contrast, internet banking and mobile banking show no statistically significant impact once other services are accounted for. This stems from persistent challenges like inadequate digital infrastructure, frequent connectivity issues, and usability barriers that hinder broader adoption. Credit cards and electronic fund transfers also fall short of strong influence in this setting. Overall, the regression model accounts for 23.8 percent of the variance in satisfaction scores. These results underscore the importance of dependable transaction mechanisms in driving satisfaction. For emerging economies, the paper recommends investments in robust digital infrastructure, enhanced service quality, and targeted customer education programs to overcome barriers and maximize e-banking benefits.

Keywords

Electronic Fund Transfers, E-Banking, Internet Banking, Mobile Banking, Credit Cards, Customer Satisfaction

1. Introduction

The rapid advancement of information and communication technology (ICT) has transformed almost every sector of the global economy, with the banking industry experiencing some of the most profound changes. Among these

innovations, electronic banking (commonly known as e-banking) has emerged as a major development that reshaped the way financial services are delivered and consumed. Traditional banks relied on physical branches and

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in-person service. Now, digital banking channels are taking over, offering convenience, easy access, and lower costs. As globalization grows and digital infrastructure improves, e-banking matters more in developed countries and emerging markets like Nepal.

Woods and Segal [18], e-banking broadly refers to the use of electronic platforms such as computers, mobile devices, and automated systems to conduct financial transactions remotely. These services include internet banking, mobile banking, automated teller machines (ATMs), debit and credit card usage, electronic fund transfers (EFTs), and online payments. The global appeal of e-banking lies in its ability to provide services beyond the limits of time and location, allowing customers to access their accounts 24/7, transfer funds across borders, and perform a wide range of financial activities without visiting a physical bank branch.

For financial institutions, e-banking is not only a way to reduce transaction costs and operational inefficiencies but also a strategic tool to enhance competitiveness, retain customers, and expand outreach. According to Morawetz [14], the adoption of e-banking has accelerated over the past three decades. Early innovations in electronic financial services during the 1980s and 1990s, such as credit cards, ATMs, and telephone banking, laid the foundation for modern digital banking. In the early 2000s, growing internet penetration enabled banks to integrate online services into their operations, offering customers secure access to financial information and transactional capabilities.

Two main models of internet banking emerged: the “integrated model,” in which banks embed digital services into their existing structures (the “bricks and clicks” approach), and the “third-party model,” in which specialized providers manage e-banking platforms on behalf of traditional banks [1]. Both models highlight that e-banking is not just an additional service but a transformative force in financial intermediation and customer relationship management.

In the context of Nepal, e-banking has been a relatively recent but steadily expanding phenomenon. The adoption of digital financial services gained momentum only in the past two decades, largely following improvements in telecommunications, internet connectivity, and government-led financial sector reforms. In urban centers such as the Kathmandu Valley, e-banking has gained popularity due to the higher concentration of commercial banks, increased financial literacy among the urban population, and greater availability of technological infrastructure. Services such as ATMs, debit and credit cards, internet banking, mobile banking, and electronic fund transfers have become increasingly common, enabling customers to perform transactions at their convenience and reducing dependence on traditional banking hours [5]. Despite these advancements, Nepal’s e-banking sector still faces significant challenges. Infrastructure limitations, such as inconsistent internet access, slow service delivery, and system downtimes, undermine customer confidence in digital platforms. Moreover, digital literacy gaps among certain demographic groups,

particularly older and rural populations, hinder widespread adoption of online services. Kadariya [10] and Khadka [12] report mixed results on customer satisfaction. Their studies show that ATMs and debit cards positively influence customer experience, while internet banking and electronic fund transfers have weak or negative effects on customer satisfaction. These findings suggest that although e-banking is becoming more popular in Nepal, its ability to improve service quality and customer satisfaction remains uneven.

Internationally, a rich body of literature highlights the benefits and challenges of e-banking adoption. Researchers have consistently found that digital banking improves efficiency, reduces transaction costs, and enhances customer convenience. For example, Mukherjee [15] emphasizes that e-banking allows customers to manage financial transactions independently of physical branches, thereby saving time and resources. Woods and Segal [18] argue that the growing appeal of online banking stems not only from convenience but also from the potential for banks to reduce costs and offer competitive financial products, such as higher-yield savings accounts.

At the same time, scholars have identified key barriers to adoption, particularly in developing economies. These include security concerns, lack of consumer trust, inadequate infrastructure, and cultural resistance to technological change. Research in South Asian contexts has shown that while urban populations are more receptive to e-banking innovations, rural communities often remain excluded due to infrastructural and educational constraints. The Nepalese case reflects this broader trend, where urban adoption is outpacing rural use, creating a digital divide in financial inclusion.

Customer satisfaction plays a crucial role in the banking sector because it directly affects customer loyalty, retention, and the overall competitiveness of financial institutions. In the context of e-banking, satisfaction is influenced by multiple factors, including ease of use, reliability, security, accessibility, and service quality. Studies have shown that services such as ATMs and debit cards are highly valued by customers because they provide immediate, tangible benefits and are relatively easy to use. In contrast, internet banking often encounters resistance due to perceived risks, lack of familiarity, and infrastructural shortcomings.

Kadariya [10] suggests a negative relationship between customer satisfaction and the use of credit and debit cards, whereas Khadka reports a negative correlation between satisfaction and services like internet banking and electronic fund transfers. These contradictory results indicate that the impact of e-banking on customer satisfaction may vary across contexts, customer demographics, and the maturity of banking infrastructure. Such gaps underscore the importance of localized studies that examine customer satisfaction within specific cultural and infrastructural settings, such as Nepal. Although several studies have examined e-banking in Nepal, much of the research has been limited in scope, often focusing on individual services or analyzing adoption without fully exploring its

impact on customer satisfaction. Moreover, the mixed findings regarding internet banking, debit cards, and electronic fund transfers call for a more comprehensive approach that considers multiple e-banking services together. This study addresses this gap by examining how a range of services ATMs, internet banking, mobile banking, credit cards, debit cards, and electronic fund transfers affect customer satisfaction in Nepal's commercial banks. The importance of this research lies in its potential contributions at multiple levels. First, it provides empirical evidence to help banks understand which services most significantly influence customer satisfaction. Second, it informs policy makers and regulators about the infrastructural and educational needs required to expand digital financial inclusion. Third, it contributes to the broader academic literature on e-banking in emerging economies, offering comparative insights relative to global trends. The aim of this research is to investigate the impacts of various e-banking services on customer satisfaction in Nepalese commercial banks, with a particular focus on the Kathmandu Valley. Using a descriptive and causal-comparative research design, data were collected from 188 customers through structured questionnaires. The analysis explores the correlation and regression relationships between different e-banking services and satisfaction levels. The findings of this study confirm that while certain e-banking services specifically ATMs and debit cards positively enhance customer satisfaction, others, such as internet banking, show insignificant or negative effects. The findings indicate that an effective digital marketing strategy depends on a clear understanding of the target market and proper segmentation, the selection of suitable marketing platforms, the creation of engaging and relevant content, the use of search engine optimization, and continuous interaction with customers to sustain their interest (Zanubiya J., Meria, & Juliansha M.A.D., [21]).

These results suggest that while Nepalese banks have made progress in adopting digital technologies, challenges remain in improving service reliability, user experience, and consumer trust. Regression analysis reveals that e-banking services account for 36.1% of the variation in customer satisfaction, highlighting their substantial, though not exclusive, role in shaping customer perceptions. The study concludes by emphasizing the need for banks to invest in digital infrastructure, improve consumer education, and expand outreach beyond urban areas to fully realize the benefits of e-banking.

2. Objectives

The following objectives:

- 1) To examine the current status of e-banking adoption among commercial banks in urban areas of Nepal.
- 2) To analyze the relationship between customer satisfaction and the use of e-banking services, specifically Automated Teller Machines (ATMs), Mobile Banking, Internet Banking, Debit Cards, Credit Cards, and Electronic Fund Transfers.

- 3) To evaluate the influence of these e-banking services (ATMs, Mobile Banking, Internet Banking, Debit Cards, Credit Cards, and Electronic Fund Transfers) on the overall satisfaction of customers in Nepalese commercial banks.

3. Literature Review

The several empirical studies in Nepal have examined the adoption and usage of e-banking services, particularly mobile and Internet banking. Using the Technology Acceptance Model (TAM), Their study highlights that usability and system reliability are major concerns among Nepalese users. Similarly, Gautam and Shrestha [7] analyzed mobile banking adoption in urban Nepal and reported that convenience, transaction speed, and perceived security positively affect customer satisfaction. However, the study also noted that limited digital literacy and fear of cyber fraud remain barriers to wider adoption. The Technology Acceptance Model explains user adoption of technology through two core perceptions: ease of use and usefulness. Ease of use refers to the degree to which an individual believes that using a system will be free from effort and errors, while usefulness reflects the belief that system use will enhance job performance. According to TAM, these perceptions significantly influence attitudes and behaviors toward technology acceptance. Built on a decade of information systems research, the model provides a strong theoretical foundation for understanding computer and digital system adoption across different contexts Welch.P. and Worthington.S., [17]. In the modern marketing environment, digital marketing has simplified market segmentation and enabled organizations to target consumers more effectively. Segment-wise marketing approaches allow firms to design more efficient and customized marketing mixes, resulting in better achievement of marketing objectives. Market segmentation also helps producers understand consumer preferences, behaviors, and expectations through the use of segment-specific data Calrk.D and Dore.J [3]. Marketing therefore plays a vital role in building mutually beneficial relationships between firms and customers. The influence of information technology is particularly evident in the banking sector, especially in public, private, and multinational banks. Technological innovations such as ATMs, internet banking, and mobile banking have expanded service accessibility and customer reach Kales.M, and matthew.R.R. [11]. New product and market development strategies are often adopted in response to competitive pressure and market saturation Yoon.C. [20]. Empirical evidence shows that ATMs and debit card services positively influence customer satisfaction in Nepalese commercial banks Earl.M.J. [6], although some studies report contrasting results, particularly regarding internet banking services Connel.B. [4].

Paudel [16] emphasized that although ATM and debit card usage is widespread in Nepal, Internet banking adoption is comparatively lower due to trust issues and system complexity. Their findings support the relevance of ATM in explaining e-

banking behavior in developing economies such as Nepal. From a diffusion perspective, Paudel [16] applied the Diffusion of Innovation theory and observed that mobile banking adoption is faster among younger, educated, and urban populations. The study confirms that relative advantage and compatibility play a key role in the diffusion of digital banking services in Nepal. Reports published by Nepal Rastra Bank (NRB) also provide strong institutional evidence), mobile banking users, QR-based payments, and digital wallets have increased rapidly, while Internet banking usage has grown at a slower but steady pace. Despite progress, NRB highlights challenges related to cyber security, service quality, and customer trust, which directly affect satisfaction levels.

Nepal-based literature consistently shows that e-banking adoption and customer satisfaction depend on perceived usefulness, ease of use, security, and service reliability. These findings strongly justify the application of TAM and DOI frameworks in the Nepalese digital banking context.

3.1. Theoretical Gap

Although ATM and DOI are widely applied to e-banking studies globally, very few studies integrate multiple behavioral theories simultaneously to explain customer satisfaction in a developing economy like Nepal. Existing research often focuses solely on adoption (intention to use) but overlooks post-adoption satisfaction, which is central to service quality evaluation.

3.2. Research Gap

Global studies lean hard on theories like ATM and DOI to predict e-banking adoption, but they rarely mix in others, like Cognitive Dissonance or Social Identity to unpack satisfaction after people start using it. In Nepal, it's even thinner, research by [10] and [12] flags wins for ATMs and debit cards but shrugs at why internet banking flops. Most work fixates on "will they try it?" in cities, ignoring rural holdouts, literacy barriers, or how services stack up together. No one's crunched a full model for commercial banks here, leaving banks guessing on what really keeps customers happy amid spotty internet and trust issues. This study fills that gap.

4. Methodology

This paper used a descriptive and causal-comparative design with a quantitative approach. It examines how e-banking services affect customer satisfaction in Nepal's commercial banks. Surveys tested hypotheses on these links, allowing objective measurements and easy replication. We targeted customers of all 20 commercial banks in Nepal's urban areas, focusing on the Kathmandu Valley. Started with 250 bank clients via convenience sampling (approaching willing folks at branches). After checking for complete responses, 188 valid surveys made the cut. Primary data: Structured questionnaires

with closed-ended questions on six e-banking services ATMs, Internet Banking (IB), Mobile Banking (MB), Credit Cards (CC), Debit Cards (DC), and Electronic Fund Transfers (EFT) plus satisfaction levels. Got consent on-site during bank hours. Secondary data used, Bank reports, published studies, and records on Nepal's e-banking trends.

4.1. Data Analysis and Interpretation

Data were analyzed using in these tools and techniques, descriptive statistics, correlation analysis, and regression analysis.

- 1) Descriptive Analysis: Frequency tables and percentages were used to summarize the demographic characteristics of respondents and their usage patterns of different e-banking services.
- 2) Correlation Analysis: Pearson correlation coefficients were calculated to assess the strength and direction of relationships between the use of e-banking services (ATMs, IB, MB, CC, DC, EFT) and the level of customer satisfaction.
- 3) Regression Analysis: Multiple regression models were employed to determine the extent to which e-banking services predict customer satisfaction. The regression model is specified as follows:

$$Y = \beta_0 + \beta_1 (\text{ATM}) + \beta_2 (\text{IB}) + \beta_3 (\text{MB}) + \beta_4 (\text{CC}) + \beta_5 (\text{DC}) + \beta_6 (\text{EFT}) + e$$

Where:

- 1) Y = Customer satisfaction
- 2) $\text{ATM, IB, MB, CC, DC, EFT}$ = Independent variables representing e-banking services
- 3) β_0 = Regression constant
- 4) $\beta_1 \dots \beta_6$ = Regression coefficients for each independent variable
- 5) e = Error term

This approach allowed for testing hypotheses and quantifying the impact of each e-banking service on overall customer satisfaction.

4.2. Ethical Considerations

Participants were informed about the purpose of the study, assured of confidentiality, and provided voluntary consent. Only respondents who agreed to participate were included in the study. No personally identifiable information was collected beyond what was necessary for analysis, ensuring adherence to ethical research standards.

5. Results

Demographics Characteristics of Respondents

A total of 188 people participated in the survey. Among them, 101 (53.72%) were male and 87 (46.28%) were female.

In terms of age, 70 respondents (37.23%) were under 25 years, 88 (46.81%) were between 26 and 35 years, 18 (9.57%) were between 36 and 45 years, 8 (4.26%) were between 46 and 55 years, and 4 (2.13%) were over 55 years old. Regarding their current position, 35 respondents (18.62%) were managers, 39 (20.74%) were officers, 84 (44.68%) were workers, and 30 (15.96%) held other positions. When looking at monthly earnings, 67 respondents (35.64%) earned up to Rs. 25,000, 63 (33.51%) earned between Rs. 25,001 and Rs. 50,000, 36 (19.15%) earned between Rs. 50,001 and Rs. 75,000, and 22 (11.70%) earned above Rs. 75,000.

Table 1. Demographics characteristics of respondents.

Respondent Character	No. of Responses	Percentage
Gender		
Male	101	53.72
Female	87	46.28
Total	188	100.00
Age		
Under 25	70	37.23
26-35	88	46.81
36-45	18	9.57
46-55	8	4.26
Over 55	4	2.13
Total	188	100.00
Present Position		
Manager	35	18.62
Officer	39	20.74
Worker	84	44.68
Other	30	15.96
Total	188	100.00
Earning Per Month		
Up to Rs. 25000	67	35.64

Respondent Character	No. of Responses	Percentage
Rs. 25001 - Rs. 50000	63	33.51
Rs. 50001 - Rs. 75000	36	19.15
Above Rs. 75000	22	11.70
Total	188	100.00

Source: field survey 2024

Banking Industry Experiences of Respondents

Table 2. Banking experience-wise distribution of respondents.

Banking Experience	No. of Respondents	Percentage (%)
Up to 5 Years	31	16.49
5 Years to 10 Years	56	29.79
10 Years to 15 Years	57	30.32
15 Years to 20 Years	30	15.96
Above 20 Years	14	7.45
Total	188	100.00

Source: field survey 2024

It is possible to deduce from table 2 that 31 respondents, which constitute 16.4 percent of the total sample size of 188, have up to five years of experience in banking, 56 respondents, which constitute 29.79 percent of the total 188, have banking experience between five and ten years, 57 respondents, which represent 30.32 percent of the total sample, have banking experience between ten and fifteen years, and thirty respondents, which represent 15.96 percent of the total sample, have banking experience between fifteen and twenty years. In addition, it is possible to deduce that fourteen of the respondents, which accounts for 7.45 percent of the total of 188 respondents, have banking experience that is greater than twenty years.

Table 3. Correlation between the effectiveness of Characteristics and Literacy.

Variables	ATM	IB	MB	CC	DC	EF	CS
ATM	1						
Internet Banking	.402**	1					
P-Value	.000						
Mobile Banking	.250**	.446**	1				
P-Value	.001	.000					

Variables	ATM	IB	MB	CC	DC	EF	CS
Credit Card	.272**	.345**	.505**	1			
P-Value	.000	.000	.000				
Debit Card	.421**	.497**	.453**	.560**	1		
P-Value	.000	.000	.000	.000			
Electronic Fund	.375**	.658**	.373**	.371**	.535**	1	
P-Value	.000	.000	.000	.000	.000		
Satisfaction	.274**	.420**	.805**	.527**	.393**	.356**	1
P-Value	.000	.000	.000	.000	.000	.000	

Table 3 shows Pearson correlation coefficients for the relationships between e-banking services ATMs, Internet Banking (IB), Mobile Banking (MB), Credit Cards (CC), Debit Cards (DC), and Electronic Fund Transfers (EF) and customer satisfaction (CS). All correlations are positive and highly significant ($p < 0.01$), confirming strong links between effective digital services and overall satisfaction. This consistent pattern highlights how well these services work as a key driver of positive banking experiences.

Among the examined variables, Mobile Banking exhibits the strongest association with customer satisfaction ($r = .805$), signifying its dominant influence on customers' evaluative judgments. This exceptionally high correlation highlights the centrality of mobile platforms in modern banking, where convenience, immediacy, and accessibility are increasingly valued. In emerging economies, mobile banking often compensates for infrastructural limitations and thus becomes a primary interface between banks and customers. The finding implies that higher levels of digital literacy and effective use of mobile banking substantially enhance perceived service quality and satisfaction. The global expansion of information technology has transformed the banking industry, accelerating the shift toward branchless and automated service delivery. Digital banking tools ATMs, mobile banking apps, Internet banking portals, debit and credit cards, electronic fund transfers, and mobile wallets enable customers to interact with banks beyond geographical boundaries Giannakoudi.A. [8]. This technological integration enhances efficiency, accessibility, and speed of transactions. The adoption of digital banking typically involves three stages: Initiation and Preparation: The of technological infrastructure, staff training, and system readiness, Conversion: The transformation of traditional banking processes into digital formats compatible with machine-based systems. Implementation and Utilization: The customer onboarding, service delivery, and continuous system upgrades.

Internet Banking demonstrates a moderate positive correlation with customer satisfaction ($r = .420$), confirming its continued relevance as a digital banking channel. Moreover, the strong correlation between Internet Banking and Electronic Fund Transfer ($r = .658$) reflects functional integration among digital services. Customers proficient in internet-based platforms are more likely to effectively utilize fund transfer services, suggesting that digital competencies are transferable across service modalities. This complementarity underscores the importance of integrated digital banking strategies rather than isolated service development.

Card-based services, including Debit Cards and Credit Cards, reveal moderate to strong inter-correlations, particularly between Debit Cards and Credit Cards ($r = .560$). These relationships suggest that familiarity and literacy in one transactional instrument reinforce usage effectiveness in others. Debit Cards also show a moderate association with customer satisfaction ($r = .393$), reflecting their routine use in daily transactions and their role in shaping baseline service perceptions. Similarly, Electronic Fund Transfer demonstrates a positive correlation with satisfaction ($r = .356$), indicating that secure and efficient fund movement contributes meaningfully to customers' overall banking experience.

In contrast, ATM services display comparatively weaker correlations with customer satisfaction ($r = .274$) and with advanced digital platforms. Although ATMs remain an essential banking channel, their reduced association with satisfaction suggests a declining marginal impact relative to mobile and internet-based services. This pattern reflects a broader structural shift in banking behavior, where customers increasingly prioritize multifunctional digital platforms over traditional, transaction-limited services.

Finally, the findings indicate that customer satisfaction is more strongly influenced by advanced and integrated digital banking services than by conventional banking channels. The strong inter-service correlations further imply that enhancing customer literacy and effectiveness in one digital service may generate positive spillover effects across other platforms. However, as correlation analysis does not establish causality,

these results should be interpreted cautiously. Future research employing multivariate regression or structural equation modeling is recommended to determine causal pathways and quantify the relative contribution of each e-banking service to customer satisfaction.

Regression Analysis

In this part, we examine how the use of automated teller machines, mobile banking, internet banking, debit cards, credit cards, and electronic fund transfers affects the level of pleasure experienced by customers.

Table 4. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.487a	.238	.212	.51527

Predictors: (Constant), ATMs, Internet Banking (IB), Mobile Banking (MB), Credit Cards (CC), Debit Cards (DC), and Electronic Fund Transfers (EFT) and customer satisfaction (CS).

Table 5. ANOVA.

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	14.977	6	2.496	9.402	.000b
Residual	48.056	181	.266		
Total	63.033	187			

Dependent Variable: CS

Predictors: (Constant), ATMs, Internet Banking (IB), Mobile Banking (MB), Credit Cards (CC), Debit Cards (DC), and Electronic Fund Transfers (EFT) and customer satisfaction (CS).

Table 6. Regression Coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
Constant	1.013	.201			5.046	.000
ATM	.194	.090	.197		2.158	.032
Mobile Banking	-.093	.103	-.103		-.905	.367
Credit Card	.001	.082	.001		.013	.989
Debit Card	.223	.075	.265		2.977	.003
Electronic Fund	.090	.088	.093		1.021	.309
Internet Banking	.135	.112	.136		1.202	.231

a. Dependent Variable: Customer Satisfactio

The results show that ATM usage and debit card services have a significant positive impact on customer satisfaction, meaning customers are more satisfied when these services perform well. However, mobile banking, credit cards, electronic fund transfers, and internet banking do not have a significant effect on customer satisfaction in this model.

Overall, ATM and debit card services are the main contributors to customer satisfaction among the factors studied.

A moderate relationship between independent variables and customer satisfaction ($R = 0.487$). It explains 23.8% of the variation in customer satisfaction, and after adjustment, 21.2% remains explained by the model. The standard error of 0.515

indicates a reasonable level of prediction accuracy, suggesting the model fits the data well. However, the results also suggest that customer satisfaction depends on other factors beyond e-banking usage, such as trust, security, service quality, and customer characteristics.

The regression model is statistically significant ($F = 9.402$, $p < 0.001$), meaning the independent variables jointly have a meaningful effect on customer satisfaction. The model explains a substantial portion of the total variation, while the remaining variation is due to other factors not included in the model. Overall, the model is useful and reliable for explaining customer satisfaction.

The results show that debit card services ($\beta = 0.265$) have the strongest positive influence on customer satisfaction, followed by ATM services ($\beta = 0.197$). Internet banking ($\beta = 0.136$), electronic fund transfers ($\beta = 0.093$), and mobile banking ($\beta = -0.103$) have weaker and non-significant effects, while credit cards ($\beta = 0.001$) have almost no influence on customer satisfaction. These results suggest that traditional and frequently used transactional services continue to play a critical role in shaping customer satisfaction. Debit cards, in particular, are integral to routine financial activities, which may explain their substantial impact on satisfaction levels. In contrast, mobile banking, internet banking, credit cards, and electronic fund transfers do not exhibit statistically significant effects on customer satisfaction in the multivariate context. This pattern suggests potential multi-collinearity or overlapping effects among digital banking channels, where advanced services may not independently enhance satisfaction unless supported by service reliability, user-friendly design, and customer literacy.

The non-significance of internet banking and electronic fund transfers further implies that the mere availability or usage of advanced digital services is insufficient to guarantee higher satisfaction. Instead, customer satisfaction may depend on qualitative dimensions such as system stability, security assurance, and responsiveness factors not captured in the present model.

The findings indicate that e-banking services have a moderate but meaningful influence on customer satisfaction. Among the services examined, ATM usage and debit card services emerge as the most significant drivers of customer satisfaction, with debit cards showing the strongest effect. These results highlight the continued importance of reliable, everyday transactional services in shaping customers' overall satisfaction. The regression model is statistically significant and explains a reasonable proportion of variation in customer satisfaction, confirming that e-banking services collectively matter. However, a substantial portion of satisfaction remains influenced by other factors not captured in the model, such as trust, security, service quality, ease of use, and customer characteristics. While advanced digital services like mobile banking, internet banking, electronic fund transfers, and credit cards do not show a significant independent effect, this does not diminish their importance. Instead, it suggests that their

impact on satisfaction depends more on service reliability, system stability, security, and user competence rather than mere availability or usage. Overall, the study underscores that basic, frequently used banking services continue to play a critical role, while digital channels must focus on quality and user experience to enhance customer satisfaction.

6. Discussions

The primary objective of this study was to examine the current landscape of electronic banking services offered by Nepalese commercial banks and to assess customer satisfaction across different digital banking channels. The descriptive findings indicate relatively lower variability in customer perceptions of credit card services compared to other e-banking facilities, as reflected by the smaller standard deviation. This suggests a more consistent evaluation of credit card services among users, likely due to their standardized functionality and widespread acceptance. These findings align with prior empirical evidence reported by Akhter [2] and Meria et al. [13], while diverging from earlier results documented by Vadivelu. A plausible explanation for this consistency is that customers perceive credit cards as an effective mechanism for minimizing in-branch congestion and reducing transaction-related travel costs, particularly in densely populated urban settings where traffic congestion remains a persistent challenge.

The second objective of the study was to investigate the relationship between customer satisfaction and various digital banking services, including automated teller machines (ATMs), mobile banking, internet banking, debit cards, credit cards, and electronic fund transfers. The findings reveal a heterogeneous pattern of relationships. While ATM usage demonstrates a positive and statistically significant association with customer satisfaction, the relationship between internet banking and satisfaction is weak and characterized by a negative coefficient. This result suggests that, despite the strategic importance of internet banking, its effectiveness in enhancing satisfaction may be constrained by usability issues, system reliability, or security concerns in the Nepalese banking context. These results are consistent with the findings of Hossain [9] and Wuisan and Handra [19] who similarly reported stronger satisfaction effects for traditional electronic channels relative to more complex digital platforms.

Further insights emerge from the regression analysis, which indicates that customer satisfaction is collectively influenced by six electronic banking variables. The statistically significant ANOVA results confirm the overall validity of the regression model and suggest a meaningful linear relationship between customer satisfaction and the utilization of selected e-banking services. Notably, debit cards and ATMs emerge as significant predictors of satisfaction, reinforcing the continued relevance of transaction-oriented services that are deeply embedded in customers' daily financial routines. In contrast, the non-significant effects of mobile

banking and internet banking in the multivariate model imply that advanced digital services may not independently drive satisfaction unless supported by adequate digital literacy, system reliability, and perceived service quality. Overall, the discussion underscores that while digital transformation in Nepalese commercial banking is progressing, customer satisfaction remains more strongly influenced by reliable, frequently used banking channels. This highlights the need for banks to complement digital innovation with improvements in service quality, user experience, and customer education to fully realize the benefits of advanced e-banking platforms.

The e-banking service delivery practices in the banking industry of Urban Nepal were investigated. Besides, they studied the effects electronic banking service delivery had on the level of satisfaction enjoyed by Nepalese private commercial banks' customers. It can be concluded that the highest number of people using banking services today are between thirty one and forty years of age, that most of the users are females, that most of the users are salaried and students, that most of the users have educational qualifications of diploma and above, and that most of the users do not maintain a full record of their customer profile in a standard format for future reference. With reference to conventional banking, demographic characteristics are related to the degree of satisfaction enjoyed by customers of online banking. More specifically, the study concluded that automated teller services, internet-based banking services, mobile banking services, credit card services, debit card services, and electronic fund transfers did not significantly contribute to consumer satisfaction. Besides, on the basis of the findings, it has been concluded that the CCS possesses the minimum variance of 0.807 while the ATM possesses the highest variation of 0.848. From this, it is evident that most of the services provided by the financial institutions in Nepal are credit card-related, compared to other services. In a nutshell, the use of electronic banking services has the potential to improve customer satisfaction, reduce the amount of time that customers have to wait in order to receive bank services, and enhance the ability of consumers to exercise control over the movements of their accounts. That the employees in financial institutions in Kathmandu are satisfied with the services provided by ATMs, and also how complaints are managed as well as problem-solving processes that are provided by the institutions. However, they are satisfied with services provided by mobile banking service providers and interpersonal service providers. Besides, the process of receiving a debit card or an ATM card is a main reason for dissatisfaction for the employees working in financial institutions in urban area of Kathmandu. There is a suggestion that has been put forward to the employees so that there would be a betterment in the quality of the banking services offered by their respective financial institutions in urban area of Kathmandu. The Staff also propose that the level of services offered by ATMs be upgraded to accommodate more necessary items.

7. Conclusion

E-banking service delivery practices in the banking industry of Urban Nepal were investigated. Besides, they studied the effects electronic banking service delivery had on the level of satisfaction enjoyed by Nepalese private commercial banks of customers. It can be concluded that the highest number of people using banking services today are between thirty-one and forty years of age, that most of the users are females, that most of the users are salaried and students, that most of the users have educational qualifications of diploma and above, and that most of the users do not maintain a full record of their customer profile in a standard format for future reference. With reference to conventional banking, demographic characteristics are related to the degree of satisfaction enjoyed by customers of online banking. More specifically, the study concluded that automated teller services, internet-based banking services, mobile banking services, credit card services, debit card services, and electronic fund transfers did not significantly contribute to consumer satisfaction. Besides, based on the findings, it has been concluded that the CCS possesses the minimum variance of 0.807 while the ATM possesses the highest variation of 0.848. From this, it is evident that most of the services provided by the financial institutions in Nepal are credit card-related, compared to other services. In a nutshell, the use of electronic banking services has the potential to improve customer satisfaction, reducing the amount of time that customers have to wait in order to receive bank services and enhance the ability of consumers to exercise control over the movements of their accounts. That the employees in financial institutions in Kathmandu are satisfied with the services provided by ATMs, and how complaints are managed as well as problem-solving processes that are provided by the institutions. However, they are satisfied with services provided by mobile banking service providers and interpersonal service providers. Besides, the process of receiving a debit card or an ATM card is the main reason for dissatisfaction for the employees working in financial institutions in urban areas of Kathmandu. There is a suggestion that has been put forward to the employees so that there would be a betterment in the quality of the banking services offered by their respective financial institutions in urban area of Kathmandu. The Staff also propose that the level of services offered by ATMs be upgraded to accommodate more necessary items.

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Author Contributions

Dipendra Bikram Sijapati: Conceptualization, Data curation, Formal Analysis, Methodology, Writing – original draft, Writing – review & editing

Manamaya Mishra: Funding acquisition, Investigation, Project administration, Supervision

Bishnu Kumar Khadka: Software, Resources, Validation, Visualization

Abbreviations

ATM	Automatic Teller Machine
ICT	Information and Communication Technology
EFTs	Electronic Fund Transfers
TAM	Technology Acceptance Model
NRB	Nepal Rastra Bank
DOI	Digital Object Identifies
IB	Internet Banking
CC	Credit Cards
MB	Mobile Banking
DC	Debit Cards
QR	Quick Response
CS	Customer Satisfaction

Conflicts of Interest

The authors declare that no conflict of interest.

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