Vol. XII, No. 1 Journal homepage: www.nepjol.info/index.php/ljbe September, 2024

The Lumbini Journal of
Business and Economics
Peer Reviewed

Digital Wallet Adoption Through Service Quality in Rupandehi District of Nepal

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Article Info

Received:
28 May 2024

Revised:
14 August 2024

Accepted:
19 September 2024

Abstract

***Purpose*:** *This research aims to investigate the dynamics of digital wallet usage in Rupandehi District considering service quality and accommodate the elements that influence digital wallet adoption.*

***Methods*:** *Data were obtained via a self-administered questionnaire using a convenience sampling method. Three hundred ninety seven bank customers, who use mobile banking services, were selected as sample. Smart PLS 4 was used to evaluate the model. The questionnaire addressed two components of the technological acceptance model namely perceived ease of use and perceived usefulness. Service quality model was used considering perceived risk and financial risk.*

Results: *Perceived ease of use, perceived usefulness and service quality have positive and direct effects on the adoption of digital wallets. The study reveals the consequences for businesses and customers in Nepal's changing digital environment through service quality and digital wallet usage.*

***Conclusion*:** *Investments and internet connectivity and mobile networks are keys to expanding digital wallet access. It is important to understand technology acceptance, service quality, and financial risk in digital wallet adoption.*

Keywords: Perceived ease of use, perceived usefulness, service quality, financial risk, adoption of digital wallet.

I. Introduction

The service industry is vital for global economic development, significantly boosting GDP, employment, and social well-being. Its growth is driven by digital transformation, internet and mobile technology, innovative business models, and the sharing economy (Vatolkina et al., 2020). As of 2023, 2.6 billion people are offline, with only 25% internet usage in low-income countries (World Bank, 2023).Additionally, 850 million people lack ID and digital skills. The World Bank aims to improve internet access, supporting digital skills and platforms for

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broader digital economy participation.

Nepal's digital economy thrives with 126% mobile penetration, 130.64% internet broadband, 23.2 million mobile banking users, 1.8 million internet banking users, and over 12 million active social media users. Nepal has 15 million e-wallet users and over 250 e-commerce platforms like Thulo.com, Sastodeal and Daraz (Nepal Rastra Bank,2080).

E-commerce and digital payments, starting with PayPal, led to mobile systems like Apple Pay. Nepal's digital payments surged due to government initiatives and increased access, with Nepal Rastra Bank promoting this shift. Digitalwallets like Samsung Pay, Google Pay, and Alipay, mobile banking apps, bill payment services, and online shopping are popular digital payment applications. The World Bank's digital adoption index for Nepal increased from 0.29 to 0.36 between 2014 and 2016, though it remains lower compared to India and China. Nevertheless, digital payments are gaining traction in Nepal, supported by government recommendations and regulatory measures. The increased use of mobile banking, e-wallets, and online payment gateways is expected to continue as more people gain access to mobile phones and the internet.

Nepal sees rising mobile banking and e-wallet use, especially among youth. Challenges include fraud, cybercrime, and rural infrastructure gaps. Nepal Rastra Bank has issued guidelines for secure digital payments (Nepal Rastra Bank,2080).

Customer satisfaction in digital services is defined by the level of fulfilment derived from product or service features. Service quality, especially in digital channels, is critical. Parasuraman et al. (1988) term electronic service quality (e-SQ) as the effectiveness and efficiency of online shopping, purchasing, and delivery. It encompasses the overall service experience in the online marketplace. E-SQ has been redefined as an assessment of the service experience given in the online marketplace (Sousa et al., 2006).

The objective of the study is to examine the factors of service quality that drive customers to adopt digital wallets. Specifically, it aims to understand how perceived ease of use, perceived usefulness, service quality, and financial risk influence digital wallet adoption in Nepal. Additionally, the research investigates how these perceptions differ across respondents with varying educational qualifications and explores the interrelationships between these factors and their collective impact on digital wallet adoption.

The study is limited to the Rupandehi district, concentrating only on banks and their relevant clients in Butwal Sub Metropolitan Municipality and Tilottama Municipality, which may restrict the findings' applicability to Nepal's larger population of digital wallet users. Second, the study only evaluates four independent variables: perceived usefulness, ease of use, service quality, and financial risk, potentially leaving out additional relevant elements.

II. Reviews

Technology Acceptance Model

The Technology Acceptance Model (TAM), introduced by Davis in 1987, provides a framework for understanding users' adoption of information technologies by emphasizing perceived usefulness (PU) and perceived ease of use (PEOU) as primary factors. Initially, TAM did not consider variables like age, gender, and experience, which limited its scope. However, it has evolved to include these additional factors, offering a more comprehensive understanding of the elements that influence technology acceptance and use. This evolution highlights TAM's strength in focusing on technological aspects while incorporating users' psycho-social perspectives, ensuring a better grasp of what drives successful technology adoption.

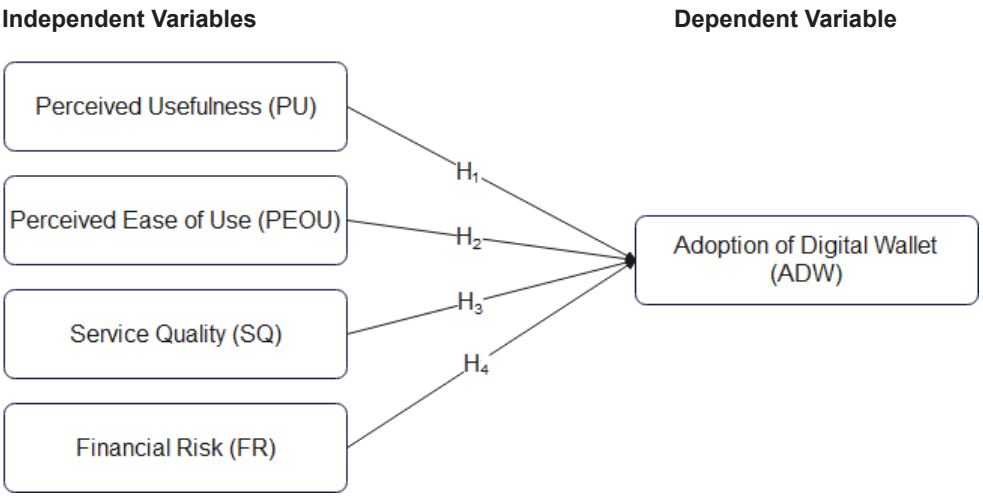
E-service Quality in E-Banking

Providing superior service quality can give banks a competitive edge. Understanding consumer perceptions of e-service quality is crucial for online firms, especially in e-banking, to ensure survival. Parasuraman et al. (2005) developed an e-service quality model with four dimensions: efficiency, system availability, fulfillment, and privacy. Additionally, E-RecS-QUAL, which evaluates online shopping service quality, includes responsiveness, compensation, and contact. Akinci et al. (2010) adapted this model for e-banking.

Recent e-banking studies (Parasuraman et al., 2005; Paschaloudis, 2014; Cetinsoz, 2015) have utilized these seven dimensions of e-service quality i.e. efficiency, system availability, fulfillment, privacy, responsiveness, compensation, and interaction as key characteristics of service quality in e-banking, aligning with previous research.

Figure 1

Research Framework



Note. Adapted from (Davis, 1993), (Oa, 2016), (Parasuraman et al., 1988)

Research Gap

Previous studies, such as those by Tharanikaran et al. (2017) and Khan et al. (2023), have primarily focused on the factors of SERVQUAL developed by Parasuraman et al. (1988). However, this research uniquely combines the Technology Acceptance Model (TAM) with the SERVQUAL model. It offers a comparative examination of digital wallet adoption through the lens of service quality, specifically in Nepal's Terai region. In Nepal, random sampling and purposive sampling methods have commonly been used in related research (Singhal et al., 2009; Ghimire et al., 2022), with SPSS as the primary analytical tool. This approach has limitations, making the analysis less robust. In contrast, this study employs a convenience sampling technique to gather a broad range of participants and insights into their behaviors and perceptions in the relevant field. For analysis, it utilizes both the latest version of structural equation modelling and SPSS, enhancing the robustness and reliability of the findings.

III. Methodology

A descriptive and causal-comparative research design within a quantitative framework has been adopted. Data were collected through closed-ended surveys created via Google Forms, which were distributed online and in paper format.

The size of the sample is determined by the research questions and objectives (Saunders et al., 2019). The total population for the study is unknown, so the minimum sample size, using the formula given by (Cochran, 1977).

$$S = \frac{z^2(P)\,(1-P)}{e^2}$$

and, Sample is 385

The study aims to explore how service quality affects the adoption of digital wallets, focusing on understanding how it influences customers' perceptions of ease of use and usefulness in their financial transactions.

Let's denote Perceived Usefulness as 'X1', Perceived Ease of Use as 'X2', Service Quality as 'X3', Financial Risk as 'X4', and Adoption of Digital Wallets as 'Y'. The multiple regression models can be expressed as follows:

$$Y = \beta 0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \epsilon$$

IV. Results and Discussion

As per the survey conducted in 2024, the self-administered questionnaire had 397 respondents, with 50.9% being male and 48.4% female. The majority (48.6%) are under 30 years old, followed by 31.5% aged 30-40, 17.1% aged 41-50, and 2.8% over 50 years old. 9.8% have a +2 or lower education level, 36.8% have a Bachelor's degree, 44.1% have a Master's degree, and 9.3% have higher degrees. Marital status shows 55.9% are married, 42.8% single, and 1.3% in other categories. In terms of income, 31.0% earn less than NPR 20,000; 23.9% earn between NPR 20,000 and NPR 50,000; 25.2% earn between NPR 50,000 and NPR 80,000; 10.1% earn between NPR 80,000 and NPR 110,000; and 9.8% make more than NPR 110,000.

Furthermore, the assessment survey item shows the measurements and validity of the outer model that are assessed through standardized outer loadings, Variance Inflation Factor (VIF), mean, and standard deviation (SD) for 26 scale items across five latent variables. All items, except PEOU3 (with a loading slightly below 0.70), have loadings above 0.70, indicating their strong contribution to the respective variables. PEOU3 is still considered acceptable since it exceeds the 0.6 threshold (Hair et al., 2022). VIF values are below 5, confirming no multicollinearity. Mean scores and SDs for all items are within an acceptable range, validating their reliability and suitability for further analysis. Specifically, perceived ease of use has a mean of 4.225 and a low SD of 0.513, indicating high and consistent user perception. Perceived usefulness has a mean of 4.174 with an SD of 0.593, showing moderate variability in user opinions. Service quality scores a mean of 3.982 and SD of 0.651, reflecting a significant range in user views. Financial risk has a mean of 3.249 and a higher SD of 0.918, suggesting more varied user perceptions. Adoption of digital wallets is strong with a mean of 4.142 and a low SD of 0.540, indicating consistent user adoption.

In this study, Cronbach's Alpha scores exceed the 0.705 threshold, confirming internal consistency (Bland et al., 1997). Composite Reliability (CR) rho_a and rho_c values are above 0.70, ensuring construct reliability and validity (Saari et al., 2021; Hair et al., 2022). Average Variance Extracted (AVE) values are above 0.50, establishing convergent validity

(Hair et al., 2022). Thus, the constructs meet all quality criteria.

Data obtained from the survey, discloses that HTMT ratio values range from 0.061 to 0.720. The standard acceptable range of HTMT ratio values is less than 0.85. As a result, discriminant validity has been established between the reflective constructs of this study (Hair et al., 2022).

The Z values for the entire construct Perceived Ease of Use, Perceived Usefulness, Service Quality, Financial Risk and Adoption of Digital Wallets fall between -1.96 and +1.96, it can be concluded that these variables follow a normal distribution.

As per the survey data 2024, one-way ANOVA analysis reveals that respondents' educational qualifications have a significant impact on their perceptions of ease of use, usefulness, service quality, and adoption of digital wallets. Specifically, people with higher qualifications (above a Master's degree) tend to perceive digital tools as easier to use, more useful, and experience higher service quality. They are also more likely to adopt digital wallets. The significant F-values and low p-values for perceived ease of use ($F = 1.433$, $p = 0.033$), perceived usefulness ($F = 0.659$, $p = 0.028$), service quality ($F = 1.005$, $p = 0.010$), and digital wallet adoption ($F = 0.446$, $p = 0.027$) confirm that education level plays a critical role in shaping these perceptions. On the other hand, perceptions of financial risk are not significantly influenced by educational qualifications ($F = 0.047$, $p = 0.986$), suggesting that concerns about financial risk are more consistent across different education levels.

In summary, higher educational qualifications appear to boost positive perceptions around digital tools and services, indicating that more educated individuals might be more comfortable and confident using such technologies.

Table 1

Correlation Analysis

	PEOU	PU	SQ	FR	ADW
PEOU	1				
PU	.544**	1			
SQ	.528**	.605**	1		
FR	0.042	0.089	0.068	1	
ADW	.489**	.494**	.485**	.104*	1

Note. Field Survey, 2024

**. Correlation is significant at the 0.01 level (2-tailed). **. Correlation is significant at the 0.05 level (2-tailed).

The Pearson correlation analysis shows that the decision to adopt digital wallets is strongly influenced by factors like ease of use, perceived usefulness, and service quality. Specifically, adoption is moderately positively correlated with perceived ease of use ($r = 0.489$, $p < 0.01$), perceived usefulness ($r = 0.494$, $p < 0.01$), and service quality ($r = 0.485$, $p < 0.01$). This means that users are more inclined to adopt digital wallets if they find them easy to use, beneficial in daily activities, and if the service provided is of high quality.

On the other hand, financial risk has only a weak positive correlation with adoption ($r = 0.104$, $p < 0.05$), indicating that while financial risk does play a role in adoption decisions, it is much less important compared to ease of use, usefulness, and service quality. Additionally, financial risk shows very minimal correlations with other factors (all coefficients below 0.1), which means that concerns about financial risk are not strongly linked to how users perceive the usability, usefulness, or service quality of digital wallets.

In summary, the analysis highlights that for users to adopt digital wallets, the perceived ease of use, usefulness, and service quality are far more influential factors than financial risk. This suggests that improving these aspects would be more effective in driving adoption.

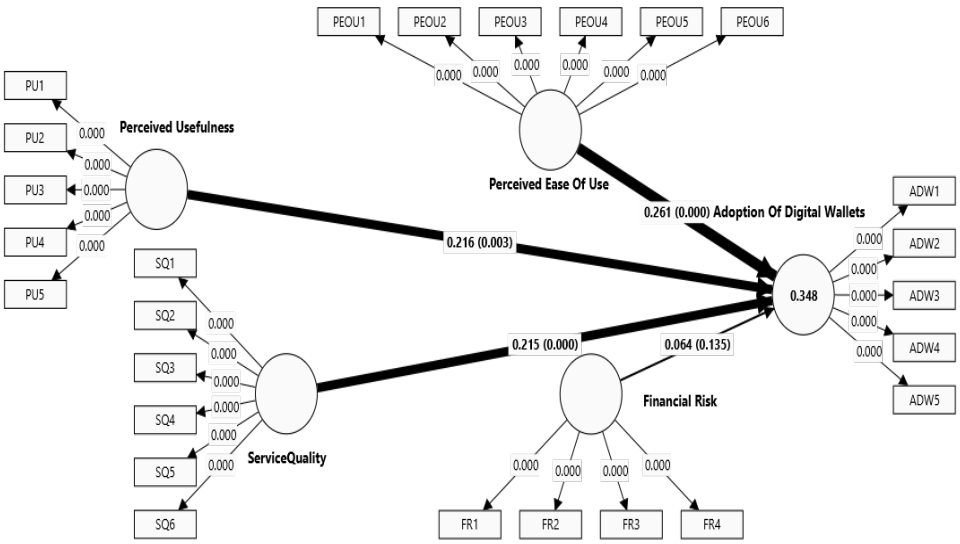
Model Fit Assessment

The goodness-of-fit indices for the model were assessed, focusing on the standardized root mean square residual (SRMR), which was 0.063—below the threshold of 0.08, suggesting a good model fit. However, the Normed Fit Index (NFI) was 0.776, which is below the recommended value of 0.90, indicating that the model's explanatory power may be limited. To evaluate the significance of exogenous variables, we used effect size (f^2), based on r-square changes as described by Cohen (1988). The F-square values for perceived ease of use (0.066), perceived usefulness (0.040), service quality (0.041), and financial risk (0.038) indicate that their effect sizes on digital wallet adoption are small. Additionally, the R-square value for digital wallet adoption is 0.348, reflecting a low level of predictive power (Hair et al., 2013).

Structural Model Assessment

Figure 2

Structural Diagram



Note. Outcome of SmartPLS 4.0

Table 2 shows the boot-strapping results under 5000 subsamples and decisions on hypotheses. Hypotheses H_1, H_2, H_3 are accepted at a 0.05 significance level. Hypotheses H_4 is rejected at a 0.05 significance level. Hence, Perceived usefulness (β=0.216; p<0.05) significantly and positively impacts on Adoption of Digital Wallets in different banking sectors. Also, Perceived Ease of Use (β=0.261; p<0.05) significantly and positively impacts on Adoption of Digital Wallets in different banking sectors. Again, Service Quality has a (β=0.215; p<0.05) significant and positive impact on the Adoption of Digital Wallets in the different banking sectors. Similarly, Financial risk has an insignificant impact (β=0.064; p<0.05) on the Adoption of Digital Wallets in different banking sectors. Though this result shows a positive impact, different research reviews show financial risks Shafi et al., (2019) have a negative impact. This may be due to advancement and more secure and encrypted methods of digital payment. So, this result

justifies the value.

Table 2

Hypothesis Testing (Direct Effect)

Hypothesis	*Original sample (O)/β*	*Sample mean (M)*	*SD*	*t-statistics*	*p-values*	*Decision*
H1: PU -> ADW	*0.216*	*0.215*	*0.072*	*2.994*	*0.003*	*Accepted*
H2: PEOU -> ADW	*0.261*	*0.262*	*0.061*	*4.306*	*0.000*	*Accepted*
H3: SQ -> ADW	*0.215*	*0.219*	*0.057*	*3.764*	*0.000*	*Accepted*
*H4: FR -> ADW**	*0.064*	*0.071*	*0.043*	*1.494*	*0.135*	*Rejected*

Note. Outcome of SmartPLS 4.0

* (ADW: Adoption of Digital Wallets, FR: Financial Risk, PEOU: Perceived Ease of Use, PU: Perceived Usefulness)

According to the source of 2024 survey, importance-performance analysis shows the important factors for the adoption of digital wallets. The results indicate that increasing service quality by 1 unit, from 74.601 to 75.601, leads to a rise in the adoption of digital wallets from 76.980 to 77.195. Similarly, a 1 unit increase in perceived usefulness, from 79.490 to 80.490, results in the adoption of digital wallets increasing from 76.980 to 77.196similarly increasing perceived ease of use by one unit from 78.514 to 79.514 increases the adoption of digital wallets from 76.980 to 77.241. Likewise, if we increase one unit of financial risk from 56.317 to 57.317, digital wallet adoption will rise from 76.980 to 77.044. As a result, perceived ease of use is the most critical factor for increasing the adoption of digital wallets in different sectors.

Among the 397 respondents, 44.1% held a master's degree, 48.6% were under 30, and 50.9% of them were men. The outer model's validity shows all items have satisfactory loadings (0.622 to 0.865) and VIF values below 5, indicating no multicollinearity. Mean and standard deviation values are within an acceptable range on a 5-point Likert scale, confirming the reliability and stability of the measurement items. Cronbach's alpha, composite reliability (rho_a and rho_c), and average variance extracted (AVE) confirm high internal consistency and construct validity. Cronbach's Alpha values exceed 0.705, Composite Reliability (CR) values surpass 0.70, and Average Variance Extracted (AVE) values exceed 0.50, meeting all quality criteria and validating the scale's effectiveness in measuring constructs. As per the HTMT analysis, HTMT ratios range from 0.061 to 0.720, indicating adequate discriminant validity among constructs.

In addition, the Kolmogorov-Smirnov test Z values for all constructs, including digital wallet adoption, fall between -1.96 and +1.96, indicating normal distribution. The analysis shows that respondents' qualifications significantly impact perceived ease of use ($F = 1.433$, $p = 0.033$), perceived usefulness ($F = 0.659$, $p = 0.028$), and service quality ($F = 1.005$, $p = 0.010$) in digital wallet adoption. However, no significant difference was observed for financial risk ($F = 0.047$, $p = 0.986$). Adoption rates also vary by qualification ($F = 0.446$, $p = 0.027$), with individuals holding qualifications above a master's level generally scoring higher in these areas. Pearson correlations show that adoption of digital wallets is significantly related to perceived ease of use ($r = 0.489^{**}$), usefulness ($r = 0.494^{**}$), and service quality ($r = 0.485^{**}$), while financial risk has a weaker influence ($r = 0.104^{*}$). The structural equation model fit is assessed using SRMR and NFI. An SRMR value of 0.063 indicates a good fit, as it's below

the 0.08 threshold.

However, the NFI value of 0.776 is below the 0.90 benchmark, suggesting the model may not fully explain the relationships among variables. The structural model shows substantial predictive power, with significant effects from perceived ease of use (β = 0.261), perceived usefulness (β = 0.216), and service quality on digital wallet adoption. Perceived ease of use has the highest impact, indicating strong influence on adoption rates. Furthermore, the Bootstrapping tests show significant direct effects of perceived ease of use (p = 0.000), perceived usefulness (p = 0.003), and service quality (p = 0.000) on digital wallet adoption. Financial risk (p = 0.135) is not significantly associated with adoption. Moreover, the Importance Performance Map Analysis reveals perceived ease of use (importance: 0.261, performance: 78.514) and perceived usefulness (importance: 0.216, performance: 79.490) are crucial and well-performing factors in digital wallet adoption. Service quality (importance: 0.215, performance: 74.601) is also important but needs improvement. Financial risk (importance: 0.064, performance: 56.317) is less critical but still an issue.

Table 3

Discussion Matrix

Authors and Date	Variables	Findings	Consistent/Inconsistent with current findings
Alswaigh et al., (2021)	I.V: PU,PEOU,SEC,TR,FC,LC, D.V: adaptation of m-wallet	Found that there is a significant positive effect of Perceived usefulness and Perceived ease of use on adaptation of m-wallet.	Consistent
Trinh et al., (2021)	PU, PEU, TRU, ENJ	Found that there is a significant relationship between Perceived usefulness and Perceived ease of use on adaptation of m-wallet.	Consistent
Nariyari et al., (2023)	SQ, CS, CL	Found that there is a significant relationship between Service quality on E-wallet users.	Consistent
Tian et al., (2023)	PU,PEU,ATT,SN,PBC,SQ	Found that there is a significant relationship between Service quality on E-wallet users.	Consistent
Fadare et al., (2016)	PR, SR, TR, SR, FR	Found that there significant negative factor affecting adoption of internet banking.	Inconsistent

V. Conclusion and implication

There is the effect of the perceived ease of use, perceived usefulness and service quality in the adoption of digital wallet. Regarding the adoption of digital wallet, service quality mostly influenced in the adoption. In addition, users having more academic qualification adopted more than the users having less academic qualification. Thus, it is necessary to facilitate with good service quality, and increase the level of education and information awareness to increase the number of digital wallet users.

Policymakers in Nepal need to promote digital wallet adoption by improving service quality through strong regulations, infrastructure, and security. Awareness campaigns and educational programs, especially in rural areas, are essential to bridge the technology gap.

Future studies should explore regions beyond Butwal and Tilottama, investigating banks

and customers. Expanding research to include alternative factors beyond traditional models (SERVQUAL, TAM) will provide deeper insights into digital wallet adoption.

Investments in internet connectivity and mobile networks are key to expanding digital wallet access. Policymakers and private companies can use study insights to guide infrastructure development, marketing strategies, and enhance user experience, fostering financial inclusion and socio-economic development.

Tech companies require to prioritize user-friendly design, security, and device compatibility to improve digital wallet platforms. By addressing usability and trust concerns, they can stand out in a competitive market, driving adoption and growth.

Managers play a crucial role in improving service quality by simplifying processes, enhancing efficiency, and ensuring compliance. Collaboration with technical teams and customer feedback helps drive innovation and improve user satisfaction.

This research expands understanding of technology acceptance, service quality, and financial risk in digital wallet adoption. Future studies can explore additional factors, cross-cultural differences, and the impact of digitalization on service quality and adoption.

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