Digital Infrastructure Development and Its Role in Bridging Nepal's Urban-Rural Economic Divide

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ABSTRACT

The study examines how the development of digital infrastructure creates economic disparities between urban and rural areas in Nepal. The researchers employed a mixed-methods research design to assess economic impacts, using primary data collected from 46 businesses and 33 individual respondents, combined with national reports. The researchers used various testing methods, including Kruskal-Wallis testing, Wilcoxon signed-rank testing, Mann-Whitney post hoc analysis, OLS regression, K-Means clustering, and bootstrap confidence interval analysis to measure digital readiness and payment system usage in urban areas and in areas with partial rural and complete rural status. The research showed that businesses achieve higher revenue growth through the adoption of digital technology, raising their earnings from NPR 132609 to NPR 170978. The urban area had the highest digital payment adoption rate of 72.95%, followed by somewhat rural areas at 45.87% and rural regions at 19.64%, while the Kruskal-Wallis test indicated significant differences ($H = 36.87$, $p < 0.001$, $\eta 2 = 0.811$). The OLS regression model accurately predicted revenue growth, explaining 65.5% of the variance ($R2 = 0.656$, $F = 40.90$, $p < 0.001$), with the Digital Readiness Index as the primary predictor ($\beta = 0.325$, $p = 0.007$). The study showed that user confidence in digital payment systems increases with continuous system use, as users maintained a strong association between their system usage and confidence levels over multiple years ($\varrho = 0.962$, $p < 0.001$). The study demonstrated that internet reliability cannot predict revenue growth because companies need to develop their digital readiness first. The study results showed no differences in revenue growth between urban areas and their neighboring rural regions ($p = 0.237$), while rural residents demonstrated moderate confidence levels ($p = 828$). The research tested nine hypotheses, with five confirmed and four unproven, thereby providing a comprehensive understanding of how digital infrastructure affects economic outcomes.

Keywords: Digital Infrastructure, Economic Divide, Financial Inclusion, Urban-Rural Integration

1. Introduction

The current digitalization efforts in Nepal work as essential resources that enable the country to achieve its goal of decreasing economic inequality throughout the nation (Timalsina & Pokharel, 2021). In 2024, digital infrastructure is the fundamental element enabling people to access the internet, with 154 million internet users and 3747 million active mobile connections. The country has undergone digital evolution, but it has not reached every part of its territory. The urban areas of Kathmandu, Lalitpur and Pokhara have rapidly developed digital services and access, while the rural areas of the Karnali and Sudurpashchim provinces still lack these services. Kathmandu provides internet access to over 70% of its residents, according to Maharjan 2025, but rural areas remain economically disadvantaged due to a lack of essential technology.

The digital divide, which first emerged in developing economies in ancient times, has become an urgent problem in Nepal as digital technologies now drive nationwide economic development. The internet has emerged as a fundamental necessity, enabling people to engage in legitimate economic activities alongside mobile banking services and digital wallets. People who lack access to technology resources experience financial difficulties because their ability to save money and achieve economic stability depends on technology access. The Government of Nepal has recognized this challenge, and multiple policy frameworks have been introduced to expand digital connectivity (Thapa & Dahal, 2026). The policies have failed to achieve uniform outcomes because most funding distribution occurs between urban centers and their neighboring areas (Bhattarai, 2021).

The digital payment systems underwent their most extensive expansion since the Nepal Rastra Bank (NRB) introduced its Digital Payment Strategy and National Payment Systems Development Strategy (NPSDS) 2014. The number of mobile banking service users has exceeded 23 million, while the number of digital wallet users exceeds 21 million, demonstrating a fundamental shift in financial transaction methods (Mishra, 2008). The Nepal Rastra Bank (2025) reported that 26 million people in Nepal used mobile banking services, indicating that digital platforms have become the primary method of retail transactions in the country (Karki et al., 2024; Khadka et al., 2024). Rural residents encounter service access problems due to insufficient broadband coverage, low digital literacy and existing regulatory frameworks. The people of Karnali province need cash for their daily expenses, whereas residents of the Kathmandu Valley use eSewa and Khalti as their primary payment methods.

Pradhan et al. (2021) described the COVID-19 pandemic, which transformed digital payments and internet usage, as the main driver of digital transformation during that period. The lockdown period created operational challenges for businesses which lacked digital solutions, while businesses with digital solutions maintained their daily operations. The pandemic demonstrated that urban and rural areas function as separate systems because rural communities lack digital infrastructure, which prevents them from accessing educational resources, medical facilities and financial services. Remote district students faced challenges attending online classes due to limited internet access, while digital methods for receiving government relief payments became unavailable to the public (Rai & Dahal, 2024; Sharma et al., 2023). Nepal's economic growth depends on solving these problems, as they impede people's active participation in the economy (Kharel et al., 2026).

The ongoing development of Nepal's digital ecosystem faces challenges because the distribution of existing infrastructure across the country makes it difficult for residents in both urban and rural regions to achieve their full economic development. The remote regions of Nepal, including Karnali and Sudurpashchim provinces, face extreme challenges due to a lack of both digital infrastructure and access to financial services (Shrestha et al., 2023). Digital service access remains restricted for users because both broadband and mobile networks operate below required standards, and users without digital skills experience problems with mobile banking and digital payment systems (Dahal et al., 2025). Businesses that establish digital systems in remote areas face obstacles because these systems require financial support that no system provides (Bhattarai, 2021). Users in rural areas experience digital service problems because mobile network coverage in their area experiences frequent connection drops and slow data speeds, which prevent them from accessing online services. The system requires people to demonstrate their digital capabilities before they can access online resources because the infrastructure mandates it.

The Nepalese regulatory framework needs updating because digital financial services have evolved rapidly.

The 13% VAT that payment service operators (PSOs) must pay creates an unfair competitive advantage for banks and financial institutions, which prevents digital payment systems from expanding. The foreign direct investment restriction in the fintech sector prevents companies from investing capital and transferring their knowledge, which would help digital progress in rural areas. Rural communities face multiple obstacles that prevent them from accessing the benefits of the digital economy, stemming from regulatory barriers and structural issues, including limited digital skills and low trust in digital technologies. The research will examine existing problems and evaluate how the development of digital infrastructure creates equal economic opportunities throughout Nepal. The study uses research questions as its primary framework for guiding its research activities.

a. Currently, what is the digital infrastructure status in Nepal and its disparities in urban, semi-urban, and rural areas?
b. What is the effectiveness, if any, of digital infrastructure development in alleviating the urban-rural economic divide?

Strong digital literacy, combined with the use of digital services, has specific impacts that shape the overall development of rural communities. The research requires three objectives that researchers will accomplish through their study. The first goal requires researchers to study Nepal's current situation regarding digital infrastructure development. The second goal requires researchers to assess how digital infrastructure implementation impacts economic activities by measuring revenue growth, assessing savings behavior and evaluating digital payment adoption. The third goal requires researchers to develop methods which will make digital access available to all provincial regions. The introduction of eSewa and Khalti by F1Soft to the market, in Bagmati and Gandaki provinces, highlighted its financial services platforms and created substantial growth in the fintech sector (Chand, 2025). However, rural residents use cash as their primary method of payment.

The researchers conducted their study according to their predetermined research timetable. The introduction section presents the research context, study objectives, and research gap. The research foundation comprises two components: the existing literature and a detailed explanation of the conceptual framework linking the formulated hypotheses. The methodology section presents the research framework and methods used to obtain data and conduct analysis. The results section presents research outcomes that test the study's hypotheses. The discussion section compares the study's findings with existing literature. The conclusion section explains the research value and the study's limitations, and presents recommendations for future research.

2. Literature Review

Research on the digital divide has received particular focus in developing nations, especially in Nepal. Digital infrastructure is the fundamental component that drives economic progress across regions. The existing research literature review section investigates research studies through four thematic areas, which directly relate to the study's research questions about socio-economic factors that impact digital access and the effectiveness of digital financial inclusion, and the relationship between political economy and entrepreneurship and their effect on digital adoption and the process through which marginalized groups attain digital empowerment.

2.1 Digital Divide and Socio-Economic Determinants

The digital divide in Nepal exists because of multiple socio-economic, factors and geographic factors and demographic factors that create this situation. Chand et al. (2024) studied the social and economic aspects of digital inequality in Nepal by analyzing survey data from multiple districts using logistic regression. Their analysis demonstrated that people from higher socio-economic backgrounds access the internet almost four times as often as those from lower-income backgrounds. The study found that male and urban participants had much higher internet adoption rates than other groups, as these factors were the main drivers of behavior. The study found that targeted interventions will be needed to prevent the digital divide from widening for women and rural communities.

Jha and Pandey (2016) analyzed multiple digital divide strategies employed by developing economies and applied their conclusions to Nepal. The research demonstrated that income inequality and educational disparities are the main obstacles to equal access to ICT services. The researchers created a model that integrates international best practices through subsidized internet programs, public-private infrastructure development partnerships, and community-based digital literacy programs. The study presented comprehensive recommendations but did not include primary research data from Nepal, thereby limiting its results to specific Nepali contexts.

Loksom (2021) used quantitative methods to study economic inequality in Nepal, drawing on national household survey data and measuring it with the Gini Coefficient and the Atkinson Index. The analysis showed that the study groups differed significantly by gender, geographic location and ethnic background. The study found that rural households spent less on consumption than urban households, which the author attributed in part to their limited access to markets and financial services. The study found that digital infrastructure had no direct relationship to its research focus. Still, results on structural inequality provided essential background information explaining why digital technology adoption rates differ across Nepalese regions.

The digital divide in the Kathmandu Valley is currently evident in Maharjan's (2025) study, which shows that connectivity within the country's most urbanized area divides people by socio-economic status. The digital divide manifests as an urban-rural divide, experienced through income and class differences within urban environments.

2.2 Digital Financial Inclusion and Payment Ecosystems

Digital financial services have become the most prominent indicator of Nepal's digital transformation. Manandhar and Shrestha (2020) conducted a study on customer satisfaction with digital wallets during the COVID-19 pandemic in Kathmandu Valley. The survey found that eSewa holds 89.8% of Nepal's digital wallet market. The study showed that the pandemic led to higher adoption rates, but most users remained on a single platform because providers did not offer multiple options. The system relies too heavily on a single provider, undermining market competition and service delivery standards, especially in areas where users cannot access other platforms.

Rahman (2023) examined how the quality of digital financial services affects financial inclusion in Madhesh Province, which has one of the lowest rates of financial inclusion in Nepal. The researchers used correlation analysis to show that digital service quality measurements were strongly positively related

to the financial inclusion rates of study participants. Users will stop using digital financial tools when they find that digital services have become accessible, because these services require dependable transaction processing and customer support, along with user-friendly features.

The research team conducted a survey across 118 companies to study how digital payment systems affect business performance in Nepalese micro, small and medium enterprises (MSMEs). The researchers found that digital payment adoption and users' assessments of system security led to better performance among micro, small and medium enterprises (MSMEs). The research showed that digital literacy does not lead to better business results because it depends on how people actually use it, rather than functioning as a separate element. The results established core principles which both guide the development of digital skills programs and provide the framework for their evaluation.

2.3 Political Economy, Entrepreneurship, and Digital Empowerment

The research investigated how political economy serves as a bridge between innovation and entrepreneurship through case studies of Nepal. The study results showed that well-organised political economies establish multiple governance systems that create transparent regulatory frameworks and institutional support mechanisms, leading to improved entrepreneurial outcomes. The researchers found that digital infrastructure needs to be studied in terms of both digital tool implementation and the associated regulatory framework, as both components affect outcomes. Digital capitalism in Nepal develops amid existing challenges and upcoming opportunities, which Pokharel (2023) identified as three major obstacles: poor infrastructure, low consumer confidence and ineffective regulatory systems.

Nepal has made substantial progress in mobile connectivity, according to research findings, but the nation faces challenges in building a reliable digital ecosystem to support the continuous use of digital technologies. The study found that trust is the primary barrier, as most participants expressed concerns about the security of digital transactions and the lack of fraud-protection solutions. Aryal (2024) studied the impact of digital platforms on the lives of disadvantaged groups across Nepal.

The researchers used fieldwork to show how rural communities in Nepal work with digital platforms to share knowledge and participate in civic activities and drive economic progress. The research study recognized several difficulties, including the possibility of online violence against women and the danger that digital technologies would create more power imbalance problems through unequal access. The author argued that digital empowerment requires protective policies alongside inclusive design elements to benefit underserved communities. Khanal (2025) demonstrated that urban areas in Gandaki Province adopt digital technology due to their diverse technological capabilities. In contrast, rural areas face major obstacles stemming from existing financial systems and fear of security threats, which go beyond their limited access to mobile phones. The financial inclusion gap will not close through the expansion of mobile coverage, according to this distinction.

The reviewed literature demonstrates that three different factors, which are socio-economic, infrastructural and technological elements, lead to digital divide problems in Nepal. The research body shows multiple themes which appear in every study. First, access to digital infrastructure shows strong geographical, income and gender-based discrimination. Second, digital services should be evaluated based on their quality, which exists as an essential requirement for their functioning. Third, trust and digital

literacy remain obstacles to technology adoption, especially in rural and semi-rural areas. Fourth, the deployment of digital tools is shaped by existing regulatory frameworks and political-economic structures. The research study aims to investigate the relationship between digital readiness, payment adoption and internet reliability and economic outcomes across various regions of Nepal, using primary data and formal hypothesis testing. The study employs multiple quantitative research techniques, while existing research relies on secondary data or qualitative methods. The research gap is addressed in this study by combining business and individual survey data and using statistical tests to assess how digital infrastructure affects economic outcomes through both direct and mediated channels.

2.4 Conceptual Framework and Hypotheses

The study demonstrates in Figure 1 that digital infrastructure is the independent variable affecting both digital readiness and adoption processes, thereby producing economic results. The geographic area serves as a moderating factor that influences these connections. The framework contains a feedback system that establishes an ongoing process that generates positive economic results, encouraging digital adoption through higher revenue and cost savings.

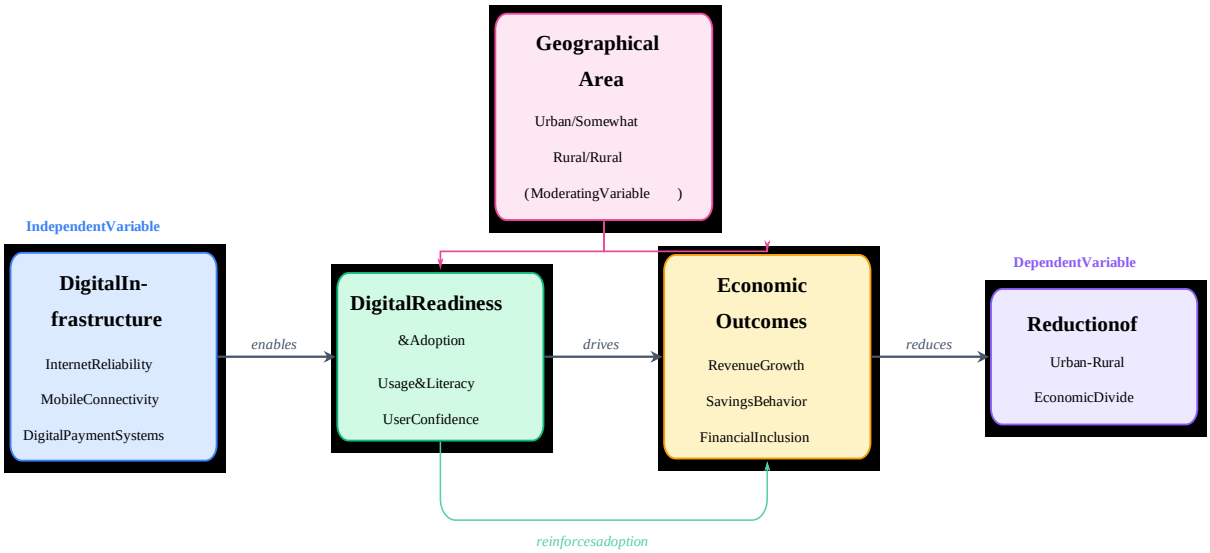

Figure 1: Conceptual Framework of the Study

Thus, hypotheses were formulated after reflecting on the backdrop and reviewing the literature.

H1: *Digital adoption significantly increases business revenue.*

H2: *Digital payment usage differs significantly across geographical areas.*

H3: *Digital readiness differs significantly across geographical areas.*

H4: *Urban and somewhat rural areas differ significantly in business revenue growth.*

H5: *Internet reliability has a significant independent effect on revenue growth when controlling for digital readiness.*

H6: *The number of digital tools used has incremental predictive value for revenue growth beyond digital payment usage.*

H7: *Salary savings differ significantly across geographical areas.*

H8: *Digital payment confidence in somewhat rural areas exceeds the moderate threshold.*

H9: *Digital payment confidence increases with years of usage.*

3. Research Methods

The study used a research design combining descriptive and analytical methods to analyze both primary and secondary data sources. The study captured 46 businesses and 33 individual respondents across Nepal's seven provinces using purposive and convenience sampling, as presented in Table 1.

Table 1: Sample Distribution by Area

Area	Business (n=46)	Job (n=33)
Urban	20	13
Somewhat Rural	15	10
Rural	11	10

The business dataset included information on province and area, business type, employee count and revenue for both periods, online presence, digital payment usage percentage, digital tools usage, internet reliability, customer growth, internet access, government assistance, e-commerce revenue percentage and digital training. The job dataset captured province, area, salary range, payment mode, savings percentage, digital payment confidence (1 to 5), expense tracking, internet quality (1 to 5), digital tools training, digital expenses percentage, government support, and years of digital reimbursement usage.

3.1 Digital Readiness Index

A composite Digital Readiness Index (DRI) was constructed:

$$DRI_i = \frac{1}{3}\left[\text{DigPayUsage}_i + \frac{\text{ToolsUsed}_i}{\max(\text{ToolsUsed})} \times 100 + \frac{\text{InternetReliability}_i}{5} \times 100\right] \quad (1)$$

3.2 Data Analysis Methods

The study applied the following analytical methods. Non-parametric tests were chosen given the sample sizes and ordinal nature of several variables. Mean ($\bar{x}$), standard deviation (s), and median were computed for all continuous variables.

3.3 Correlation Analysis

Pearson product-moment correlations (r) were used to assess the bivariate linear relationships among continuous variables in the business and job datasets. For hypothesis H9, which tests the monotonic association between years of digital payment usage and confidence, the Spearman rank correlation coefficient (ρ) was employed:

$$\rho = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n(n^2-1)} \quad (2)$$

where di is the difference between the ranks of corresponding values and n is the number of observations.

3.4 Wilcoxon Signed-Rank Test

To test whether revenue changed significantly after digital adoption (H1), the Wilcoxon signed-rank test

was employed as a non-parametric alternative to the paired t-test. The test statistic W is defined as:

$$W = \sum_{i=1}^{n} \text{sign}(x_{2i} - x_{1i}) \cdot R_i \quad (3)$$

where x1i and x2i are paired observations (revenue before and after) and Ri is the rank of |x2i −x1i|. Cohen's d was computed as the effect size, defined as the ratio of the mean difference to the standard deviation of the baseline measure:

$$d = \frac{\overline{x_{\text{after}}} - \overline{x_{\text{before}}}}{s_{\text{before}}} \quad (4)$$

3.5 Kruskal-Wallis H Test

To compare distributions across three geographical areas (H2 to H6), the Kruskal-Wallis test was used:

$$H = \frac{12}{N(N+1)} \sum_{j=1}^{k} \frac{R_j^2}{n_j} - 3(N+1) \quad (5)$$

The effect size was measured through the application of eta-squared. The complete sample size is represented by N while the number of groups is denoted by k and the group size is defined by nj and the group j rank sum is represented by Rj.

$$\eta^2 = \frac{H-k+1}{N-k} \quad (6)$$

Post-hoc pairwise comparisons were conducted using Mann-Whitney U tests with Bonferroni correction ($\alpha adj = 0.05/3 = 0.0167$).

3.6 OLS Regression

To capture the relationship between revenue growth and digital metrics, an ordinary least squares (OLS) regression was performed.

$$\text{RevGrowth}_i = \beta_0 + \beta_1 \cdot \text{DRI}_i + \beta_2 \cdot \text{InternetReliability}_i + \varepsilon_i \quad (7)$$

where in our case, β0 is the intercept, β1 and β2 stand for the regression coefficients, and εi is the error term.

3.7 K-Means Clustering

The K-Means clustering method was used to divide businesses into different groups, which works by reducing the total of squared distances between data points and their closest cluster centers.

$$\arg\min_{S} \sum_{j=1}^{k} \sum_{x_i \in S_j} |x_i - \mu_j|^2 \quad (8)$$

The set of observations in the ith cluster is Si with the corresponding centroid μi. The optimal value of k was identified by silhouette analysis.

3.8 Bootstrap Confidence Intervals

To construct robust 95% confidence intervals without distributional assumptions, bootstrap resampling (10,000 iterations) was applied:

$$CI_{95\%} = [\hat{\theta}^*_{(0.025)}, \hat{\theta}^*_{(0.975)}] \quad (9)$$

Where $\hat{\theta}^*_{(\alpha)}$ denotes the α-th percentile of the bootstrap distribution of the statistic θˆ.

3.9 Nested-Model F-Test

To evaluate whether adding a predictor provides incremental explanatory power (H6), a nested-model comparison was conducted using the partial F-test:

$$F = \frac{(SS_{\text{res,reduced}} - SS_{\text{res,full}})/(p_{\text{full}} - p_{\text{reduced}})}{SS_{\text{res,full}}/(n - p_{\text{full}})} \quad (10)$$

where SSres denotes residual sum of squares, p denotes the number of parameters, and n is the sample size.

3.10 One-Sample t-Test

To test whether a group mean exceeds a specified threshold (H8), a one-sample t-test was employed:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} \quad (11)$$

where $\bar{x}$ is the sample mean, μ0 is the hypothesized threshold, s is the sample standard deviation, and n is the sample size.

4. Results

4.1 Business-Related Data Analysis

Table 2: Pearson Correlation Matrix, Business Dataset (n=46)

	RevGrowth	DRI	DigPay	Tools	Internet
RevGrowth	1.000				
DRI	0.809***	1.000			
DigPay	0.816***	0.983***	1.000		
Tools	0.772***	0.970***	0.939***	1.000	
Internet	0.768***	0.959***	0.923***	0.879***	1.000

*** $p < 0.001$

As presented in Table 2, all pairwise Pearson correlations among the business-related variables were positive and statistically significant at the p < 0.001 level. Revenue growth exhibited strong positive correlations with the Digital Readiness Index (r = 0.809), digital payment usage (r = 0.816), the number of digital tools used (r = 0.772), and internet reliability (r = 0.768). Businesses that maintain higher levels of digital engagement across all indicators experience greater revenue growth, according to these findings. The correlation between digital payment usage and DRI is strong (r = 0.983), as digital payment usage is one of the three elements used to calculate DRI (Equation 1). The near-perfect correlation leads to

multicollinearity in regression models, but the DRI was developed as a composite measure to prevent its distinct parts from being used as simultaneous predictors.

4.2 Revenue Growth by Area

The revenue growth distribution across three geographical regions shows both growth rates and their corresponding 95percent confidence intervals obtained through bootstrap methods. The highest average revenue growth in urban areas reached 31.03 percent with a 95 percent confidence interval ranging from 27.48 percent to 34.51 percent. The second highest revenue growth rate occurred in somewhat rural areas which recorded a growth rate of 28.34percent with a confidence interval that ranged between 26.37 percent and 30.33 percent. The lowest revenue growth rate appeared in rural areas which achieved 17.37 percent with a confidence interval ranging from 16.03 percent to 18.71 percent. The confidence interval plot shows that urban and somewhat rural areas share overlapping confidence intervals, but the rural area is completely distinct from both. The rural category shows two distinct confidence intervals which demonstrate that rural businesses obtain significantly lower revenue growth than their urban and somewhat rural business counterparts, and sampling variability cannot explain this particular revenue difference.

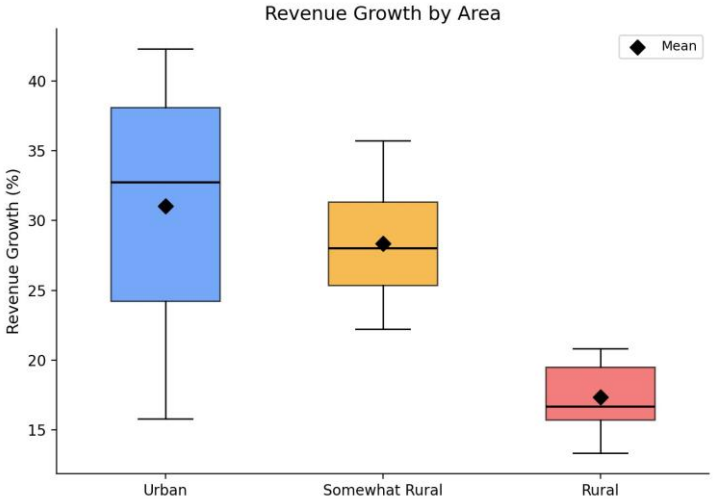

Figure 2: Revenue Growth by Area

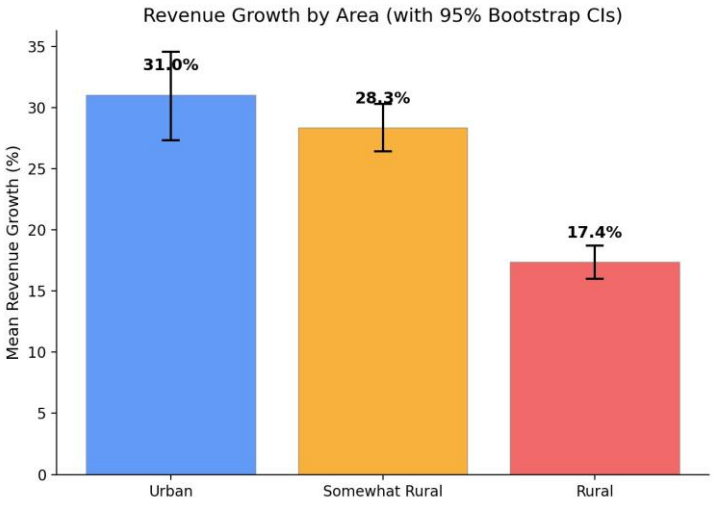

Figure 3: Revenue Growth by Area with 95% Bootstrap Cis

4.3 Digital Payment Usage and Readiness by Area

The distribution of digital payment usage and Digital Readiness Index measurements across various geographic regions is displayed in Figures 4 and 5. Urban areas achieved better results than other locations, with residents using digital payments at 72.95% and maintaining a DRI score of 73.98. The rural areas demonstrated intermediate outcomes, with residents using digital payment systems at 45.87% and achieving a DRI score of 48.18. The results demonstrate a digital adoption pattern that starts in urban areas and moves toward rural areas, with the digital adoption gap between somewhat rural and rural areas being the most pronounced. The lower DRI scores in rural areas indicate two problems that prevent people from using digital payments: a lack of digital payment systems, digital equipment and reliable internet access. The digital deficit in rural areas stems from multiple factors.

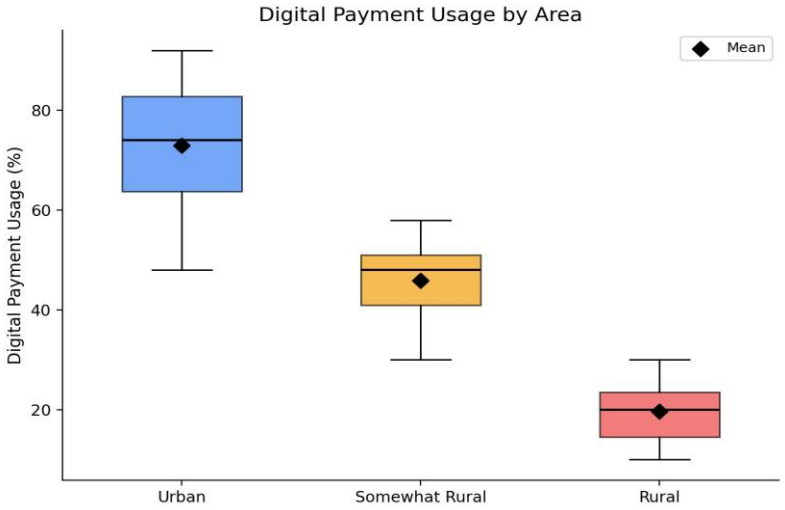

Figure 4: Digital Payment Usage by Area

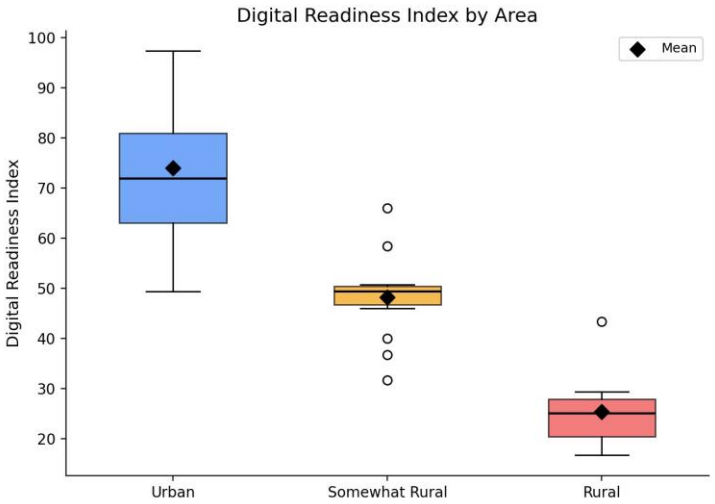

Figure 5: Digital Readiness Index by Area

4.4 K-Means Clustering

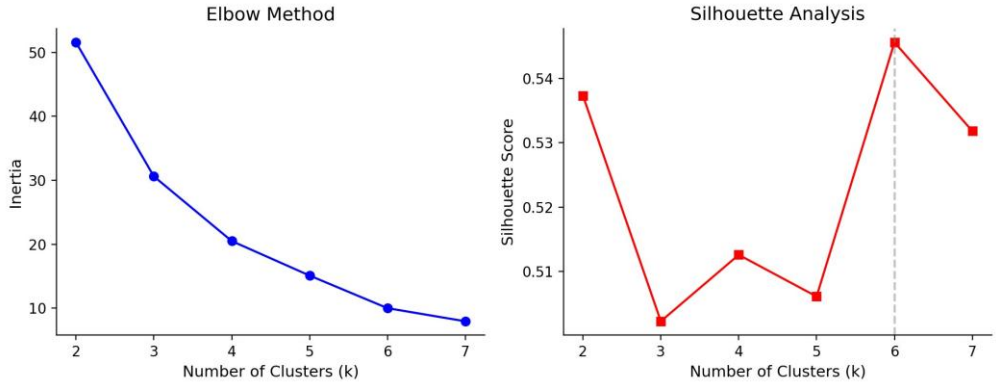

Figure 6: Elbow Method and Silhouette Analysis

The K-Means clustering analysis divided businesses into groups based on their digital payment usage and revenue levels, with the elbow method and silhouette analysis used to determine the optimal number of clusters. A six-cluster solution was selected, yielding a silhouette score of 0.546, indicating that the clustering structure is suitable. The most successful clusters (Clusters 3 and 4) exhibited a complete urban business profile, with digital payment usage at 86% and monthly revenue exceeding NPR 300,000. The businesses in Cluster 2, which included 11 of the 13 rural businesses, had the lowest digital payment usage at 21.6% and the lowest average revenue at NPR 58,462. Digital engagement in business operations and economic performance are two elements that demonstrate their close relationship, while a business's geographic location determines which clusters it will join.

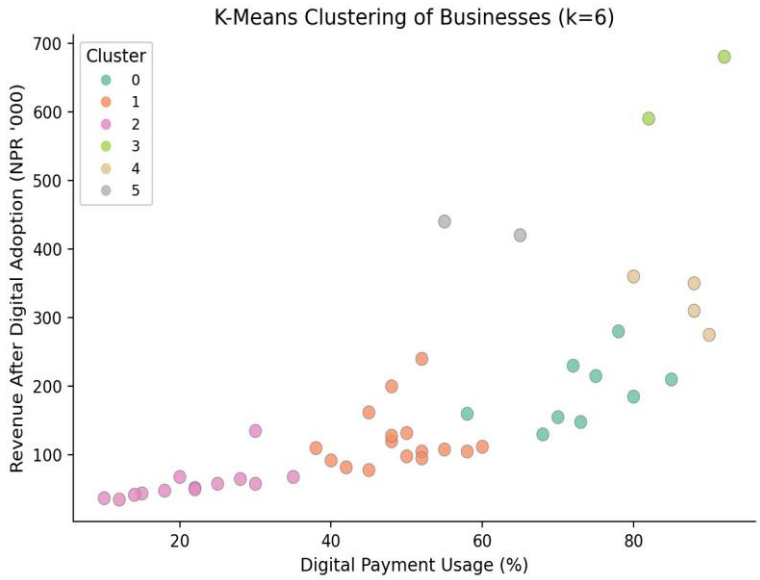

Figure 7: K-Means Clustering of Businesses (k = 6, silhouette = 0.546)

4.5 Revenue Before vs. After Digital Adoption

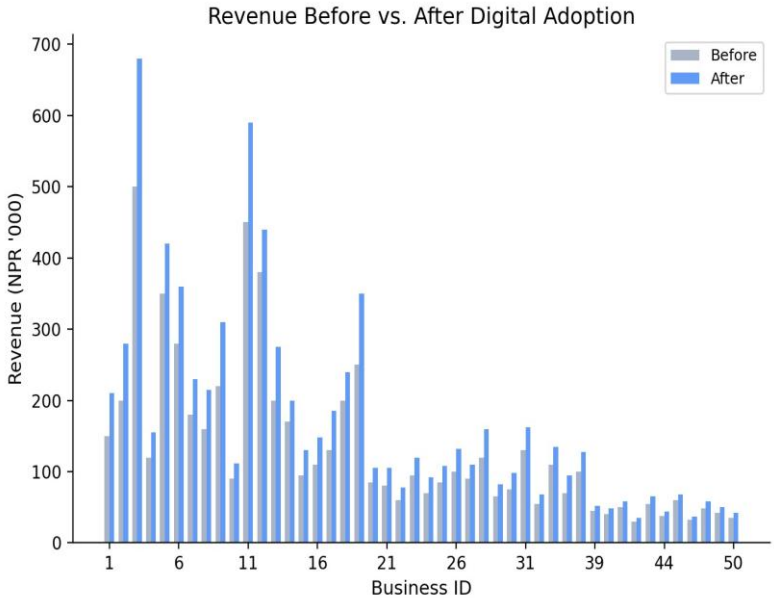

Figure 8: Revenue Before vs. After Digital Adoption

Figure 8 displays the revenue evaluation results for the business operations before and after the digital system began functioning. The mean monthly income increased from NPR 132,609 before digital adoption to NPR 170,978 after adoption, resulting in a mean revenue increase of approximately NPR 38,370. The three geographical areas showed revenue growth, but the regions experienced varying levels of growth. Town businesses showed higher total revenue growth because they began with larger revenue amounts, while rural businesses achieved only minimal revenue growth. The change showed a consistent direction across all areas, providing initial support for H1; however, the formal evaluation of this hypothesis will take place in the upcoming section dedicated to hypothesis testing.

4.6 Distribution of Businesses

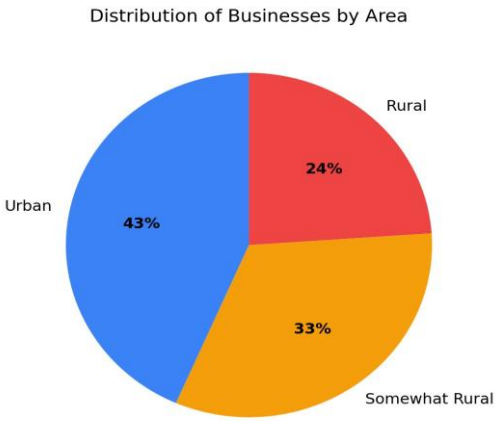

Figure 9: Distribution of Businesses by Area

4.7 Job-Related Data Analysis

The Pearson correlation matrix in Table 3 shows that all five job dataset variables exhibit high

correlations, with pairwise coefficients exceeding 0.94. The strongest connection between the savings percentage and the digital expenses percentage showed a correlation of 0.989, indicating that people who pay more of their bills online tend to save more of their earnings. Digital payment confidence showed a strong relationship with Internet quality (0.979) and digital payment usage duration (0.953). The researchers found that digital engagement functions as a single behavioral pattern which results in high intercorrelations among the activities studied. The researchers found that the small sample size (n=33) creates challenges for evaluating the reliability of these estimates.

Table 3: Pearson Correlation Matrix, Job Dataset (n=33)

	Save%	Conf	ExpDig%	NetQ	YrsDig
Save%	1.000				
Conf	0.949***	1.000			
ExpDig%	0.989***	0.972***	1.000		
NetQ	0.965***	0.979***	0.981***	1.000	
YrsDig	0.969***	0.953***	0.971***	0.948***	1.000

*** $p < 0.001$. Conf = Confidence; ExpDig = Digital Expenses; NetQ = Internet Quality.

4.8 Savings and Confidence by Area

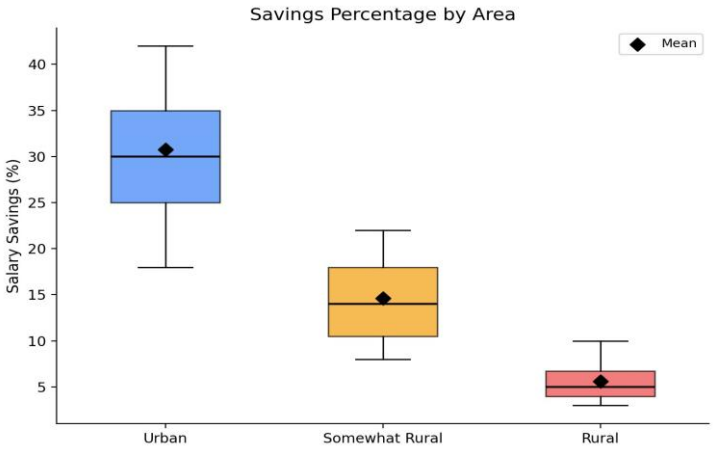

Figure 10: Savings Percentage by Area

Figures 10 and 11 demonstrate the savings rates and trust levels in digital payment systems show different patterns across various geographical areas. Urban respondents reported the highest average savings at 30.77% of salary (95% CI [26.92%, 34.46%]) and the highest confidence in digital payments at 4.31 out of 5. The respondents who lived in somewhat rural areas showed savings of 14.60% which had a confidence interval from 11.80% to 17.40%. The rural respondents achieved the lowest results for both measures, showing savings of 5.60% with a 95% confidence interval of 4.40% to 6.90% and a confidence level of 1.40. The savings gap between urban and rural respondents shows that urban respondents save more than five times the amount saved by their rural counterparts. People who use digital financial services through digital infrastructure access formal banking services, which enable them to save money more effectively, while their employment status and income level determine their saving patterns.

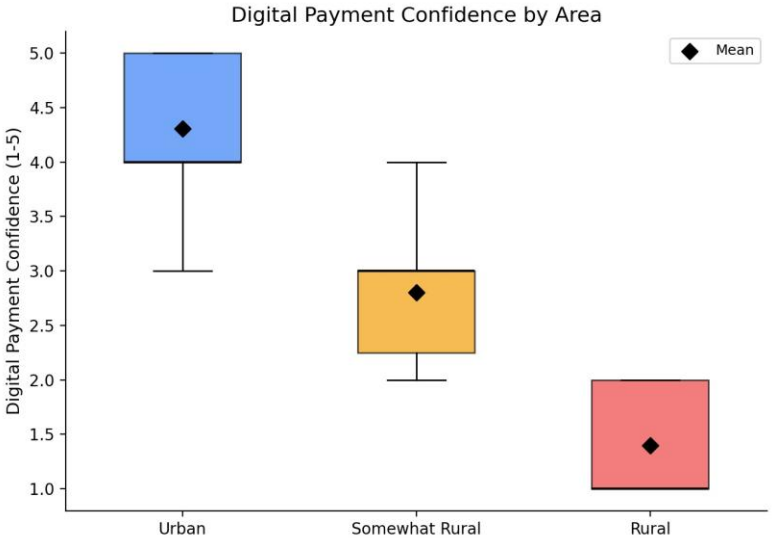

Figure 11: Digital Payment Confidence by Area

4.9 Confidence vs. Years of Usage

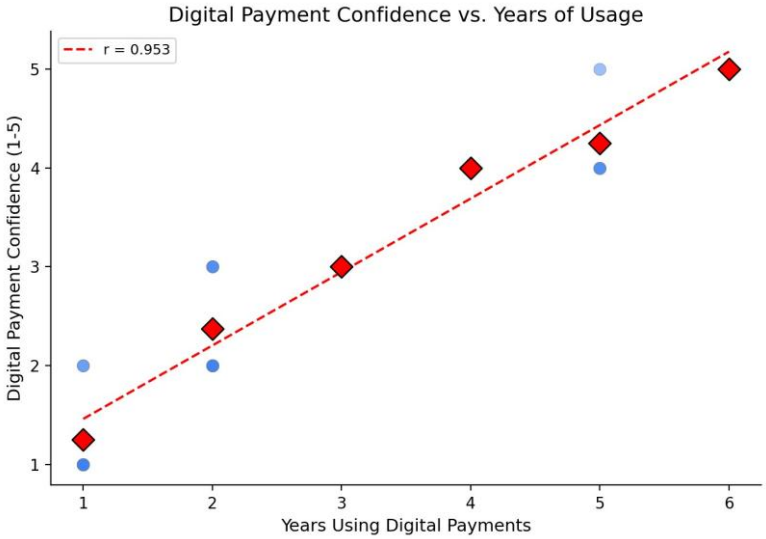

Figure 12: Digital-time spend distributed over time, correlated for personal assessment (ρ = 0.962).

Figure 12 shows the relationship between confidence in digital payments and years of use. The data show that confidence levels rise continuously with each additional year of use: users reported confidence levels for digital payments after one year of use at 1.25, increasing to 5.00 for users with six years of experience. Users who maintain their digital payment system usage will develop trust through extended experience, as results show that greater system usage is associated with higher trust levels. The study found a very strong, positive, monotonic relationship between these two variables, with a Spearman correlation coefficient of 0.962 and a p-value < 0.001. Users in the first stage of usage require the most assistance because their confidence develops through a series of gradual improvements.

4.10 Distribution of Respondents

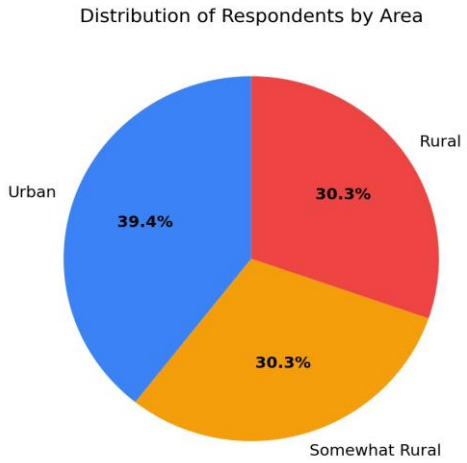

Figure 13: Distribution of Respondents by Area

4.11 Hypothesis Testing

Table 4 presents the descriptive statistics for all key variables across geographical areas.

Table 4: Descriptive Statistics of Key Variables by Geographical Area

Variable	Area	N	Mean	SD	95% CI (Lower)	95% CI (Upper)
Revenue Growth (%)	Urban	20	31.03	8.47	27.48	34.51
	Somewhat Rural	15	28.34	4.09	26.37	30.33
	Rural	11	17.37	2.38	16.03	18.71
Digital Payment Usage (%)	Urban	20	72.95	13.25	67.20	78.50
	Somewhat Rural	15	45.87	7.71	42.00	49.47
	Rural	11	19.64	6.52	16.00	23.27
Digital Readiness Index	Urban	20	73.98	14.89	67.60	80.40
	Somewhat Rural	15	48.18	8.11	44.22	52.11
	Rural	11	25.33	7.37	21.55	30.00
Salary Savings (%)	Urban	13	30.77	7.26	26.92	34.46
	Somewhat Rural	10	14.60	4.81	11.80	17.40
	Rural	10	5.60	2.17	4.40	6.90
Digital Payment Confidence (1 to 5)	Urban	13	4.31	0.63	4.00	4.62
	Somewhat Rural	10	2.80	0.63	2.40	3.20
	Rural	10	1.40	0.52	1.10	1.70

95% CIs computed via bootstrap resampling (10,000 iterations)

Table 5 presents the summary of all hypothesis tests. Of the nine hypotheses tested, five were supported, and four were not supported at $\alpha = 0.05$ (Table 5). The supported hypotheses are discussed first, followed by the non-supported ones.

Table 5: Summary of Hypothesis Testing Results

H	Hypothesis	Test	Statistic	p-value	Effect Size	Result
H1	Revenue increases after digital adoption	Wilcoxon	$W = 0.0$	$p < 0.001$	$d = 0.351$	**Supported**

H2	Digital payment usage differs across areas	Kruskal-Wallis	$H = 36.87$	$p < 0.001$ $\eta^2 = 0.811$	**Supported**
H3	Digital readiness differs across areas	Kruskal-Wallis	$H = 36.04$	$p < 0.001$ $\eta^2 = 0.792$	**Supported**
H4	Urban and somewhat rural differ in revenue growth	Mann-Whitney	$U = 186.0$	$p = 0.237$ $r = 0.240$	Not Supported
H5	Internet reliability independently predicts revenue	OLS t-test	$t = -0.297$	$p = 0.768$ –	Not Supported
H6	Digital tools add value beyond payment usage	Nested F-test	$F = 0.036$	$p = 0.851$ –	Not Supported
H7	Savings differ across areas	Kruskal-Wallis	$H = 27.00$	$p < 0.001$ $\eta^2 = 0.833$	**Supported**
H8	Somewhat rural confidence exceeds 3.0	One-sample t	$t = -1.000$	$p = 0.828$ –	Not Supported
H9	Confidence increases with years of usage	Spearman	$\rho = 0.962$	$p < 0.001$ –	**Supported**

5 of 9 hypotheses supported at $\alpha = 0.05$.

Business revenue showed significant growth after companies adopted digital systems, according to the Wilcoxon signed-rank test for H1, which resulted in W = 0.0 and p < 0.001, and Cohen's d value of 0.351, and a bootstrap 95% CI for the mean difference: [NPR 28,521, NPR 49,478]. The W statistic was 0.0 because all 46 businesses in the sample demonstrated revenue growth after adopting digital technologies, with no revenue declines between any business pairs in the study. The Cohen's d value of 0.351 falls within the small-to-medium range by conventional benchmarks, indicating that all businesses achieved statistically significant revenue growth, but their base revenue increased at a moderate rate.

The Kruskal-Wallis tests for H2 and H3 found that people in different geographical regions used digital payments at different rates (H = 36.87, η2 = 0.811) and showed digital readiness results with high effect sizes (H = 36.04, η2 = 0.792). The eta-squared values exceeded 0.79 in both cases, indicating that geographical area explains a major portion of the differences observed in these measurements. The analysis showed that savings differed between regions, with a statistically significant effect (H7: H = 27.00, η2 = 0.833). The Spearman correlation for H9 confirmed a strong positive association between years of digital payment usage and confidence (ρ = 0.962, p < 0.001), as detailed in Table 7. Table 6 presents the findings of Mann-Whitney U post hoc comparisons, combined with a Bonferroni correction, for the digital payment usage (H2) analysis.

Table 6: Mann-Whitney U Post-Hoc Comparisons, Digital Payment Usage (%)

Comparison	U	p-value	p (adj.)	R	Sig.
Urban vs. Somewhat Rural	288.0	0.000004	0.000013	0.775	***
Urban vs. Rural	220.0	0.000006	0.000018	0.812	***
Somewhat Rural vs. Rural	164.5	0.000023	0.000069	0.830	***

*Bonferroni-corrected α = 0.0167. r = rank-biserial effect size. *** p < 0.001.*

The analysis conducted after the main study established that all three tested pairs of groups showed significant differences which reached large effect sizes according to Bonferroni corrections. The rank-

biserial correlations ranged from 0.775 to 0.830 which established that the groups maintained strong boundaries between their identity factions. The research shows that urban and slightly rural areas, together with rural regions, exhibit different rates of digital payment adoption, creating distinct usage patterns. The study tested the unsupported hypothesis by examining H4, which claimed that urban and slightly rural areas exhibit different revenue growth patterns. The Mann-Whitney U test yielded a U value of 186.0 and a p-value of 0.237, indicating a small effect size (r = 0.240). The findings indicate that businesses in somewhat rural areas achieve revenue growth that matches that of their urban rivals because digital adoption delivers economic returns until they reach specific digital-readiness thresholds.

The study showed that all three tested pairs of groups exhibited statistically significant differences, which showed large effect sizes according to Bonferroni corrections. The rank-biserial correlations ranged from 0.775 to 0.830, indicating that the groups maintained strong boundaries between their identity factions. The research demonstrates that urban, slightly rural and rural areas exhibit distinct levels of digital payment usage and adoption patterns.

The research examined unsupported hypotheses by analyzing H4, which examined revenue growth patterns between urban and suburban areas. The Mann-Whitney U test yielded a U value of 186.0 and a p-value of 0.237, indicating a small effect size (r = 0.240). The findings indicate that businesses in somewhat rural areas achieve revenue growth that matches their urban rivals' because digital adoption delivers economic advantages until businesses reach specific digital readiness thresholds.

Table 7: Digital Payment Confidence by Years of Usage (n=33)

Years	n	Mean Confidence	SD
1	8	1.25	0.46
2	8	2.38	0.52
3	4	3.00	0.00
4	5	4.00	0.00
5	4	4.25	0.50
6	4	5.00	0.00

Spearman $\rho = 0.962$, $p < 0.001$.

4.12 Regression Analysis

The OLS regression model (Table 8) was statistically significant, with an F-statistic of 40.90 and a p-value of 0.001, and accounted for 65.5% of the revenue.

Table 8: OLS Regression: Revenue Growth (%)

Variable	β	SE	t	p
(Intercept)	11.585	2.448	4.733	<0.001***
Digital Readiness Index	0.325	0.114	2.850	0.007**
Internet Reliability	−0.711	2.396	−0.297	0.768

$R^2 = 0.656$, Adj. $R^2 = 0.639$, $F = 40.90$, $p < 0.001$.

Dependent Variable growth (R2 = 0.656, Adjusted R2 = 0.639). The Digital Readiness Index emerged as a significant predictor of revenue growth (β = 0.325, p = 0.007), indicating that a one-unit increase in

DRI led to a 0.325 percentage-point increase in revenue growth, while internet reliability remained unchanged. The DRI group showed significant results, but internet reliability did not when tested alongside DRI. The finding supports H5 because the composite DRI measure detects all important economic variations in digital presence better than any single infrastructure element. Digital readiness is an important predictor of revenue growth for businesses, explaining 65.5% of it, but business type, market conditions and managerial capability remain unaccounted for in the current model.

4.13 Insights from Secondary Data

Table 9: Summary of Digital Payment Strategy and Growth in Nepal

Aspect	Details
NRB's Strategy	NPSDS 2014 under NRB Act 2002.
Growth	Significant momentum from 2016, rapid post-2020.
PSPs/PSOs (2024)	27 PSPs and 10 PSOs.
Popular Methods	Mobile Banking (23.2M users), Wallets (21.2M users).
Regulatory Gaps	PSOs collect 13% VAT; BPi is exempt from tax. FDI is capped at 15%.
Proposed Solutions	Exemption from VAT; relaxation on FDI; Centralized KYC; Unified QR.

The latest data from Nepal Rastra Bank (2025) confirms this explosive growth, showing that more than 26 million people use mobile banking services, making digital platforms the primary method for conducting retail transactions.

Table 10: Evolution of Digital Infrastructure: Pre- and Post-COVID

Aspect	Pre-COVID	Post-COVID
Wallet Penetration	Limited; eSewa 91.3%.	eSewa 89.8%, Khalti 6.1%.
Usage Frequency	Weekly 41.8%.	Weekly 53.1%, daily 24%.
Barriers	Security, trust concerns.	Tech-literacy gaps in rural.
Ecosystem	No interoperability.	Push for unified QR systems.

Table 11: Internet and Social Media Connectivity in Nepal (2024)

Aspect	Details (2024)
Internet Users	15.40 million (49.6% penetration)
Social Media	13.50 million (43.5% of the population)
Mobile Connections	37.47 million (120.6% of the population)
Urban vs. Rural	Urban: 22.1%, Rural: 77.9%
Internet Speeds	Mobile: 15.79 Mbps (+17%), Fixed: 57.82 Mbps (+19.3%)

5. Discussion

The study results demonstrate that digital infrastructure has a major economic impact, with different effects across Nepal's regions. The research tested nine hypotheses and confirmed five as valid, while the other four were false, demonstrating how digital infrastructure enables economic integration. The

Wilcoxon signed-rank test showed that businesses achieved substantial revenue increases after adopting digital solutions (H1: mean increase of NPR 38,370; $p < 0.001$; Cohen's $d = 0.351$), indicating a small-to-medium effect. Bhattarai et al. (2023) found that digital payment systems improve MSME performance through financial and operational benefits. The revenue growth observed among urban companies aligns with Gilani et al. (2024), who found that high smartphone and internet usage in urban areas drives both e-commerce growth and economic development. The Kruskal-Wallis tests showed that digital payment usage (H2: $\eta 2 = 0.811$), digital readiness (H3: $\eta 2 = 0.792$), and savings (H7: $\eta 2 = 0.833$) exhibit substantial geographical differences, yielding consistently large effect sizes across regions. The research results support the findings of Chand et al. (2024), which demonstrated that internet access depends on two main factors: higher socioeconomic status and urban residence.

The research established that digital payment systems build user trust through ongoing use, as H9 showed a strong Spearman correlation ($\rho = 0.962$, $p < 0.001$). The non-supported hypotheses provide valuable insights. The null hypothesis for H4 ($U = 186.0$, $p = 0.237$) posits that urban areas and semi-rural regions exhibit identical revenue growth patterns because their citizens use digital payment systems at different rates and their systems have varying levels of operational capability. The findings demonstrate that organizations experience economic advantages from digital adoption until they reach a specific point, after which additional digital readiness does not lead to proportional revenue growth. The pattern matches the post-COVID adoption trends presented in Table 10, as rural areas showed rapid growth in digital wallet usage.

Researchers demonstrated that internet reliability served as a distinct predictor, as the statistical analysis yielded $t = -0.297$ and $p = 0.768$. The study shows that internet reliability affects revenue growth, as it is strongly linked to the Digital Readiness Index, which in turn influences business development through digital infrastructure. The study results align with Rahman's (2023) research, which identified service quality as the primary driver of financial inclusion, surpassing any specific infrastructure component. Organizations must develop their digital competencies and improve their Internet access if they want to achieve better financial outcomes than their current performance through Internet access.

The nested F-test results for H6 showed that digital tool usage did not improve the accuracy of revenue growth predictions, even after accounting for digital payment usage ($F = 0.036$, $p = 0.851$). Bhattarai et al. (2023) found that digital literacy did not affect business success, indicating that the assumption that more tools lead to better results does not hold, as users with multiple digital tools showed no performance improvement. The finding shows that organizations should prioritize their digital engagement depth, which measures digital transaction share, over their digital engagement width, which counts their tool usage.

The rejection of H8 ($t = -1.000$, $p = 0.828$) demonstrates its actual value, as it provides the strongest evidence against the research hypothesis. Rural respondents demonstrated more confidence than urban respondents; however, their trust in digital payment systems was below the established threshold (mean = 2.80 vs a threshold of 3.0). The study demonstrates that Pokharel's 2023 research results identify consumer trust as the primary barrier preventing Nepali citizens from using digital services in transitional areas.

The World Bank study (2025) demonstrates that urban and rural residents use different saving methods because digital connectivity is essential for Nepalese adults seeking access to credit and formal savings options in their growing economy. The research by Khanal (2025) establishes that different geographical regions exhibit varying levels of access to digital technologies: urban areas experience multiple technological advancements, whereas rural areas face mobile technology security problems and financial limitations.

The research results need verification through testing secondary data. The digital payment system in Nepal has shown significant development since 2016, as Table 9 demonstrates, but the system still experiences regulatory deficiencies. The savings gap between urban areas (30.77 per cent) and rural areas (5.60 per cent) demonstrates the economic restrictions identified by Jha and Pandey (2016) and Nepal (2023).

6. Conclusion

The study investigated digital infrastructure as an instrument that connects the economic activities of Nepalese people living in both urban and rural areas. The research tested nine hypotheses and supported five, providing comprehensive details on how digital infrastructure affects economic outcomes.

The supported hypotheses confirmed that digital adoption significantly increases revenue (Cohen's $d = 0.351$); that different geographical areas show substantial differences in digital payment usage, readiness and savings (with large effect sizes up to $\eta 2 = 0.833$); and that people develop greater confidence through continuous engagement ($\varrho = 0.962$). The non-supported hypotheses noted two vital discoveries.

The finding that urban and somewhat rural areas do not differ significantly in revenue growth (H4: $p = 0.237$) indicates that rural businesses are successfully bridging the economic gap through the implementation of digital technology. The non-significance of internet reliability as an independent predictor (H5: $p = 0.768$) shows that infrastructure needs both digital literacy and tool integration for proper implementation. The finding that digital tool count adds no predictive value beyond payment usage (H6: $p = 0.851$) shows that people need to achieve deep digital engagement rather than simply using as many digital tools as possible.

The research results showed that study participants at two moderate confidence levels maintained a trust deficit that needed to be resolved, according to their assessment (H8: mean = 2.80). The International Finance Corporation (2025) found that QR-based and digital payment systems, which benefit MSMEs by reducing transaction costs, require financial training programs to help rural users access them. The study's results lead to two recommendations. The first recommendation requires policy changes that will enable improvements in digital readiness through three methods: system interoperability enhancements, VAT inconsistency solutions and foreign investor market access simplification.

Digital literacy programs should teach students essential skills while building their confidence, and be tailored to the needs of rural areas, which currently have underdeveloped infrastructure and low levels of trust. Organizations should provide incentives to increase users' digital participation by encouraging more transactions through online systems, rather than focusing on the number of technologies they use.

The research study has three procedural issues because it uses small sample sizes of 46 businesses and 33 individuals, and examines only digital payments without studying cultural and behavioral factors. Future research should involve larger sample sizes, include provincial-level assessments and examine digital transformation in education, healthcare and e-governance.

References

Aryal, A. (2024). From digital divide to digital empowerment: Transforming marginalized communities. *Social Innovations Journal, 25*. https://socialinnovationsjournal. com/index.php/sij/article/view/8242

Bhattarai, B., Shrestha, R., Maharjan, S., Malla, S., & Shakya, S. (2023). Effectiveness of digital payments in the performance of Nepalese micro, small and medium enterprises (msme). *New Perspective: Journal of Business and Economics, 6*(1), 9–22. https://doi.org/10.3126/npjbe.v6i1.58868

Bhattarai, M. K. (2021). Information and communication technology scenario of Nepal: Assessing policy environment and challenges. *Nepal Public Policy Review, 1,* 201– 211. https://doi.org/10.3126/nppr.v1i1.43443

Chand, M., K.C., S., & Maharjan, M. (2024). Unveiling disparities: A case of digital divide in Nepal. *The Journal of Economic Concerns, 15*. https://doi.org/10.3126/ tjec.v15i1.70246

Chand, N. (2025). *Impact of the digital payment on consumer behavior in Nepal* [Master's thesis, LAB University of Applied Sciences]. https://www.theseus.fi/bitstream/ handle/10024/893795/Chand Nirmala.pdf

Dahal, R. K., Sharma, B. B., Ghimire, B., Karki, D., & Joshi, S. P. (2025). An informatics-based analysis of consumer trust, website design, and e-commerce logistics in Nepal. *Journal of Logistics, Informatics and Service Science, 12*(8), 40–57. https://doi.org/10.33168/JLISS.2025.0803

Gilani et al. (2024). Advancing the digital economy: E-commerce's role in the banking sector. In *Cases on e-commerce and digital economy*. IGI Global. https://www.igiglobal.com/viewtitle.aspx?TitleId=387073

International Finance Corporation. (2025). *Digital financial services in Nepal* (tech. rep.). World Bank Group. https://www.ifc.org/content/dam/ifc/doc/2025/digitalfinancial-services-in-nepal.pdf

Jha, S., & Pandey, S. (2016). Digital divide: Exploring national and international approaches to bridge the digital divide in the perception of developing countries, especially in the context of Nepal. *International Journal of Latest Trends in Engineering and Technology, 7*(3), 368–383. https://doi.org/10.21172/1.73.549

Karki, D., Bhattarai, G., & Dahal, R. K. (2024). User acceptance determinants in m-banking adoption. *Nurture, 18*(1), 201–213. https://doi.org/10.55951/nurture.v18i1.565

Khadka, P. B., Karki, D., Dahal, R. K., & Khanal, D. (2024). Mapping the landscape of green finance and banking performance research: A bibliometric analysis. *Journal of Service, Innovation and Sustainable Development, 5*(1), 176–193. https://doi.org/10.33168/SISD.2024.0110

Khanal, R. (2025). Role of mobile banking in bridging the urban-rural financial gap: Evidence from Gandaki Province. *Devkota Journal of Interdisciplinary Studies, 7*(1), 126–157. https://doi.org/10.3126/djis.v7i1.84600

Kharel, S., Dahal, R. K., & Joshi, S. P. (2026). Digital Service Innovation in Urban Waste Logistics: Evidence from Post-Pandemic Household Behaviors in Kathmandu. *Journal of Logistics, Informatics and Service Science, 13*(3), 24–56. https://doi.org/10.33168/JLISS.2026.0302

Loksom, P. K. (2021). *' Economic inequality' evidence from Nepal* [Doctoral dissertation, University of Leicester]. https://doi.org/10.25392/leicester.data.17105258

Maharjan, S. (2025). *Stratified connectivity: A descriptive study of the digital divide in Kathmandu Valley* (tech. rep.). CM Publisher. https://cmpublisher.com/wpcontent/uploads/2025/09/Shyam Maharjan.pdf

Manandhar, R. B., & Shrestha, S. K. (2020). Customer satisfaction towards digital wallets during covid-19 pandemic in Kathmandu Valley. *European Journal of Molecular and Clinical Medicine*. https://www.researchgate.net/publication/380187961 Customer Satisfaction towards Digital Wallets during Covid-19 Pandemic in Kathmandu Valley ISSN 2063-5346 Section A-Research paper 5060 Eur

Mishra, B. B. (2008). The development of e-payment and challenges in Nepal. In *The development of e-payments and challenges for central banks in the seacen countries* 159–160. https://www.researchgate.net/profile/Vincent-Lim-7/publication/ 227577043 The Development of E-payments and Challenges for Central Banks in

The SEACEN Countries/links/57454fc408aea45ee8538883/The-Development-ofE-payments-and-Challenges-for-Central-Banks-in-The-SEACEN-Countries.pdf# page=169

Nepal, A. (2023). Role of political economy in mediating innovation and entrepreneurship– a perspective based on some cases from Nepal. *Access Journal*, *4*(2), 205–220. https://doi.org/10.46656/access.2023.4.2(5)

Nepal Rastra Bank. (2024). A study report on the ussd-based payment system and its regulations: Suggestions for Nepal. *NRB Payment Systems Oversight Report*. https: //www.nrb.org.np/contents/uploads/2024/10/A-Study-Report-on-the-USSDbased-Payment-System-and-its-Regulations-Suggestions-for-Nepal-1.pdf

Nepal Rastra Bank. (2025). *Payment systems oversight report 2023/24* (tech. rep.). Payment Systems Department, NRB. https://www.nrb.org.np/contents/uploads/ 2025/01/Payment-Oversight-Report-2023-24.pdf

Pokharel, S. (2023). Development in digital capitalism: Challenges and prospects of Nepal.

KMC Research Journal, *7*(1), 101–111. https://doi.org/10.3126/kmcrj.v7i1.65080

Pradhan, P., Subedi, D. R., Khatiwada, D., Joshi, K. K., Kafle, S., Chhetri, R. P., Dhakal, S., Gautam, A. P., Khatiwada, P. P., Mainaly, J., et al. (2021). The COVID-19 pandemic not only poses challenges but also opens opportunities for sustainable transformation. *Earth's Future*, *9*(7), e2021EF001996. https://doi.org/10.1029/ 2021EF001996

Rahman, A. (2023). Digital finance as a tool for financial inclusion in Nepal Mahesh Province. *Journal of Management & Entrepreneurship*, *1*. https://ssrn.com/ abstract=4419430

Rai, B., & Dahal, R. K. (2024). Social media marketing initiatives and brand loyalty. *Nepal Journal of Multidisciplinary Research*, *7*(1), 22–39. https://doi.org/10.3126/njmr.v7i1.65241

Sharma, B. B., Shahi, B. J., & Dahal, R. K. (2023). Customer loyalty and relationship marketing in the Nepalese telecommunications sector. *The Harvest*, *2*(1), 1–16. https://doi.org/10.3126/harvest.v2i1.54405

Shrestha, A., Paudyal, Y. R., Paudel, S. P., Maharjan, S., & Niraula, M. (2023). *Who gets online?*

examining the socioeconomic factors of internet adoption in Nepal (tech. rep.). Nepal Administrative Staff College (NASC). https://nasc.org.np/ sites/default/files/IT%20Infrastructure%20report.pdf

Thapa, J., & Dahal, R. K. (2026). Mapping the psychology of digital payments and consumer spending behavior: A bibliometric review and contemporary research agenda. *Journal of System and Management Sciences, 16*(1), 71–96. https://doi.org/10.33168/JSMS.2026.0105

Timalsina, R., & Pokharel, R. (2021). Digitization and changing landscape of social and democratic life in Nepal. *Rooting Nepal's Democratic Spirit*, *181*. https://library. fes.de/pdf-files/bueros/nepal/19322.pdf

World Bank. (2025). *Nepal - the global findex database 2025: Connectivity and financial inclusion in the digital economy* (tech. rep.). Microdata Library. https:// microdata.worldbank.org/index.php/catalog/7952/pdf-documentation