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AWARENESS AND ADOPTION DETERMINANTS TOWARDS DIGITAL PAYMENT SYSTEM AMONG SMALL BUSINESSES IN HIMACHAL PRADESH

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ABSTRACT

The Digital Payment Systems (DPS) has expanded rapidly in India due to technological advancements, government-led digital initiatives, and increasing consumer preference for cashless transactions. Himachal Pradesh has also experienced a steady rise in DPS adoption, with small enterprises in urban and semi-urban regions increasingly using UPI, QR-code payments, and mobile wallets. These systems offer significant benefits, including improved record-keeping, faster transactions, reduced cash-handling risks, and enhanced access to formal financial services. However, adoption remains inconsistent, particularly in remote and high-altitude areas where internet connectivity is unstable. Limited digital literacy, fear of cyber fraud, and concerns about taxation further restrict widespread usage among micro and small business owners. This study examines the awareness level, adoption and usage patterns of DPS among small businesses in Himachal Pradesh and identifies areas requiring targeted interventions to strengthen digital financial inclusion. The study identified the awareness level and key drivers of adoption of DPS and challenges that micro and small business holders encounter in the digital payment system. The digital payments contributed positively for the business growth with the help of DPS. In addition, large portion of sales done through the digital transactions and low dependency on cash transactions. The digital payments reducing transaction time. Safety, security, complete confidence to resolve failed or delayed transactions, reflecting moderate confidence and technical errors remain the major concern. Despite these are some major challenges for the adoption of the DPS, the business owners intentionally want to use and expand DPS usage to continue and grow the use of digital payment systems. The expansion of the digital payment methods can strengthen financial inclusion and promote sustainable digital growth in Himachal Pradesh.

Keywords: *DPS, UPI, SMEs, QR-code, POS etc.*

1. INTRODUCTION

Adoption of the Digital Payment Systems (DPS) has inflated in India, driven by advancements in financial technology, government initiatives, and increasing consumer preference for cashless transactions. Digital Payment Systems provide these enterprises with several operational advantages. Improved record-keeping, faster settlements, reduced handling of physical cash, minimization of human error, and expanded access to formal credit through transparent transaction trails are among the key benefits. DPS also enables micro and small entrepreneurs to reach new market segments, particularly tech-savvy consumers and tourists who prefer cashless payments [1]. By integrating digital transactions into everyday business operations, small enterprises can enhance proficiency, boost customer satisfaction, and increase their overall competitiveness.

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1.1 Digital Payment System in India

India's digital payment system includes Unified Payments Interface (UPI), which allows for instant, app-based transfers; traditional methods like net banking, credit/debit cards, and mobile wallets; and other systems like Aadhaar Enabled Payment System (AEPS), IMPS, NEFT, and RTGS. Driven by the government's Digital India programme, this ecosystem has grown significantly, with UPI emerging as a dominant, low-cost, and convenient platform for both person-to-person and merchant payments. Key digital payment systems in India are: Unified Payments Interface (UPI), Mobile Wallets, Net banking and Mobile banking Aadhaar Enabled Payment System (AEPS), Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT), Real-Time Gross Settlement (RTGS) and Card Payments etc. Adoption of the Digital Payment Systems (DPS) in India has enhanced rapidly over the past decade, driven by innovations in financial technology, strong government initiatives, and a growing societal shift toward cashless transactions [2].

Due to efforts of the Government with all stakeholders in India the digital payments have increased in the last few years. At a CAGR of 44%, the total volume of digital payment transactions grew from 2,071 crore in FY 2017–18 to 18,592 crores in FY 2023–2024. Digital Payment Transactions has seen a significant development notably after FY 2013-14. The digital payment transactions have increased from 220 crore in FY2013-14 to 18,592 Crore in FY2023-24. During the same period, the value of transactions has increased from ₹ 952 lakh crore to ₹ 3,658 lakh crore. Digital payments have seen massive growth, with transaction volumes increasing by 44% from FY18 to FY24. UPI is a major driver of this growth, accounting for over 75% of retail digital payments in FY23. These systems are crucial for financial inclusion, making it easier for individuals and businesses, including those in rural areas, to access and use financial services. The government is actively promoting the internationalization of platforms like UPI and RuPay, making them accessible in other countries. The digital payment acceptance has grown rapidly as a result of the coordinated efforts of the atmosphere in the country. It is was 0.31 crore in FY 2017–18 and rose up to 26.95 crore in FY 2022–2023. As per the RBI report there were 36.14 crores in March 31, 2024 acceptance of digital payments in the country.

1.2 Digital Payment System in Himachal Pradesh an Overview

The rapid expansion of Digital Payment Systems (DPS) in India over the past decade has significantly reshaped financial behaviour among consumers, businesses, and government institutions [3]. Himachal Pradesh, though characterized by mountainous terrain, dispersed settlements, and an economy dominated by micro-enterprises, has also experienced a notable rise in digital financial activity. Driven by national initiatives such as the Unified Payments Interface (UPI), BharatNet, the JAM trinity, and the Digital India programme, the state has progressively strengthened its digital ecosystem, enabling small businesses to integrate cashless payment systems into their daily operations.

Significant advancements in digital governance and service delivery are reflected in state level data. In addition to an increase in online citizen services across departments, the Himachal Online Seva (e-District) portal reported over 1.5 million digital transactions in 2024-2025. Furthermore, a significant percentage of regular payments like power bills are now made online, demonstrating the high level of user acceptance of electronic payment methods. The rising electronic processing of government receipts in Himachal Pradesh shows that public institutions are spearheading the transition to digital channels and creating an environment that is conducive to the commercial use of DPS.

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In Himachal Pradesh, small enterprises are gradually switching to digital payments, especially those in rural and semi-urban areas. Good financial record-keeping, efficiency in transaction and further financial inclusion are some advantages of the Digital Payment Systems [4]. Overall, while Himachal Pradesh demonstrates encouraging progress in the development of digital infrastructure and public-sector electronic transactions, the adoption of DPS among small enterprises remains uneven. Targeted interventions, such as digital literacy programmes, improved rural connectivity, secure payment mechanisms, and micro-merchant incentives are critical to strengthening financial inclusion and enabling a deeper digital payments ecosystem across the state.

2. LITERATURE REVIEW

2.1 Critical Review of Literature

The existing body of literature on digital payment systems (DPS) highlights significant progress in understanding adoption patterns, benefits and challenges, particularly in developing economies. However, a closer examination reveals inconsistencies, contextual limitations, and underexplored dimensions that necessitate further investigation. Several empirical studies (Kumar, 2022 [5] ; Phatak, 2023 [6]) report a strong positive impact of digital payment adoption on business performance, including increased revenue, improved customer acquisition, and enhanced operational efficiency. These findings suggest that DPS acts as a catalyst for business growth. However, these studies are largely urban-centric (Delhi, Pune) and based on relatively small or localized samples, raising concerns about their generalizability to geographically complex regions such as Himachal Pradesh. In contrast, studies focusing on rural or semi-urban contexts emphasize persistent infrastructural and literacy barriers, indicating that the benefits of DPS are not uniformly realized across regions.

A significant contradiction emerges in the literature regarding the role of demographic factors. While studies such as Dixit and Sharma (2024) [13] and related works suggest that age, gender, and education significantly influence adoption behavior, other studies (e.g., Alrawad et al., 2023) [7] argue that trust and perceived risk override demographic influences in determining usage intentions. This divergence indicates that behavioral and psychological factors may be more dominant than socio-demographic variables, particularly in technology-driven financial systems.

Furthermore, research grounded in models such as TAM and UTAUT consistently identifies perceived usefulness, ease of use, and social influence as primary drivers of adoption (Chauhan & Sharma, 2024) [8]. However, recent international studies (Ha et al., 2025 [16]; Thanigana et al., 2025 [18]) extend this understanding by incorporating trust, financial literacy, digital infrastructure, and institutional support as critical determinants. This suggests that traditional models may be insufficient in fully explaining DPS adoption in developing and geographically diverse regions, where external constraints play a more significant role.

Another area of divergence relates to financial inclusion outcomes. While studies such as Dhakad and Baag (2024) [10] and Khurana et al. (2025) [20] highlight the transformative role of fintech and UPI in enhancing financial inclusion, other research points out that digital divide issues (connectivity, digital literacy, language barriers) continue to exclude certain populations. This indicates that digital payment systems may simultaneously promote inclusion and reinforce exclusion, depending on contextual factors.

Additionally, while most studies emphasize the benefits of DPS (speed, efficiency, transparency), there is a consistent acknowledgment of security concerns, transaction failures, and trust deficits (Alrawad et al., 2023 [7]; Brown et al., 2024 [9]). However, the extent to

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which these risks influence long-term adoption remains unclear, as many studies adopt a cross-sectional approach rather than examining behavioral changes over time.

Importantly, a review of recent high-impact international literature reveals a shift toward integrated and data-driven approaches, including the use of machine learning, big data analytics, and longitudinal datasets to understand digital financial behavior (Afjal, 2023 [15]; Sadarsopewale & Kadam, 2026 [19]) .Such approaches are largely absent in existing Indian small-business-focused studies, indicating a methodological gap.

Overall, while the literature provides valuable insights into DPS adoption, it remains fragmented and context-specific, with limited focus on hilly and geographically constrained regions, insufficient integration of behavioral and infrastructural variables, and a lack of long-term and comparative analysis.

2.2 Theoretical Framework for Digital Payment Adoption

The adoption of digital payment systems (DPS) among small businesses can be better understood through established theoretical models of technology acceptance and innovation diffusion. This study incorporates key frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT) [11] and Diffusion of Innovation (DOI) Theory to provide a strong conceptual foundation. The Technology Acceptance Model (TAM) [12] explains that the adoption of digital payment systems is primarily influenced by two factors: perceived usefulness and perceived ease of use. In the context of small businesses in Himachal Pradesh, perceived usefulness is reflected in improved transaction speed, better record-keeping, and business growth, while ease of use is associated with the simplicity of UPI, QR codes, and mobile payment applications. The Unified Theory of Acceptance and Use of Technology (UTAUT) [17] extend this framework by incorporating additional determinants such as social influence and facilitating conditions. Social influence plays a significant role as customers increasingly prefer digital payments, encouraging business owners to adopt DPS. Facilitating conditions, such as smartphone availability, internet connectivity, and government initiatives, further support the adoption and continued usage of digital payment systems. The Diffusion of Innovation (DOI) theory explains how new technologies spread across populations over time. In this study, the adoption of DPS among small businesses can be linked to innovation characteristics such as relative advantage (faster transactions and reduced cash handling), compatibility (alignment with existing business practices) and complexity (ease or difficulty of use). The gradual shift from cash to digital payments reflects the diffusion process across different categories of adopters [14]. By integrating these theoretical models, the study establishes a comprehensive framework to analyze the awareness, adoption behavior and challenges associated with digital payment systems among small businesses.

2.3 Research Gap

Despite the growing body of literature on digital payment systems, several critical gaps remain:

2.3.1 Lack of Context-Specific Studies

Most existing studies are concentrated in urban or metropolitan areas, with limited focus on geographically challenging regions such as Himachal Pradesh. The unique constraints of hilly terrains, including connectivity issues and dispersed populations, remain underexplored.

2.3.2 Contradictory Evidence on Determinants of Adoption

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There is inconsistency in findings regarding the influence of demographic factors versus behavioral factors (trust, perceived risk). This indicates a need for integrated models that capture both dimensions simultaneously.

2.3.3 Limited Longitudinal and Impact-Based Research

Existing studies largely focus on short-term adoption outcomes, with insufficient analysis of long-term impacts on business sustainability, financial resilience, and growth.

2.3.4 Neglect of Behavioral and Psychological Factors

While technological factors are widely studied, variables such as trust, risk perception, digital confidence and user experience remain inadequately examined, particularly among small business owners.

2.3.5 Digital Divide and Inclusion Paradox

Although DPS promotes financial inclusion, disparities in digital literacy, infrastructure and access create exclusion risks. Comparative rural–urban and regional analyses are limited.

2.3.6 Methodological Limitations

Most studies rely on basic statistical tools and cross-sectional data. There is a lack of advanced analytical approaches such as machine learning, big data analytics, and predictive modeling.

2.3.7 Limited Focus on Micro and Small Enterprises

The majority of research emphasizes consumers rather than small business owners, despite their critical role in driving digital payment ecosystems.

3. RESEARCH METHODOLOGY

This study is based on exploratory research design. To fulfill the objectives of this research quantitative as well qualitative research approach is used. The data was collected through structured questionnaires, multiple open as well as close ended questions used. Likert scale was also incorporate in the questionnaire to attain the objectives of the study. The study adopts a mixed-method approach combining both quantitative and qualitative techniques. The quantitative component involves structured questionnaires and Likert scale-based responses, which were analyzed using statistical tools such as mean, standard deviation, correlation, and regression. The qualitative component includes open-ended responses and informal interviews with business owners, which provide deeper insights into perceptions, challenges, and experiences related to digital payment systems. This integration of methods enhances the comprehensiveness and validity of the study.

3.1 Need and Significance of the study

As per the previous research, some issues and challenges faced by all the stakeholders of Digital Payment System. It is necessary to understand the obstacles and barriers of Digital Payment System for shaping financial policies, improving digital literacy, and strengthening the financial ecosystem in Himachal Pradesh. It also helps small business owners get beyond obstacles to the adoption of digital payment system and use digital finance to grow their businesses. The review indicates a gap in region-specific studies focusing on Himachal Pradesh, motivating this research.

3.2 Objectives of the study

1. To analyze the demographic variations in the level of awareness regarding Digital Payment Systems (DPS) among small businesses in Himachal Pradesh.

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2. To examine the adoption level of Digital Payment System (DPS), including financial transparency, business growth, and customer convenience in Himachal Pradesh.
3. To provide recommendations for increasing Digital Payment Systems (DPS) adoption among small businesses in Himachal Pradesh.

3.3 Source of Data Collection

The study is focused secondary as well primary data. Mainly the research was based upon the primary data.

3.3.1 Primary Data Collection:

Surveys and interviews were conducted from small business owners. Case studies of small businesses that are successfully using to the Digital Payment System. In the present study, Multi-stage Sampling method is used to collect the primary data from Himachal Pradesh. Himachal Pradesh is divided into three administrative divisions after that, one district from each division selected on the basis of maximum population are Kangra, mandi and Shimla is selected and data was collected from headquarter of selected district, so that, Dharamshala (Headquarter of Kangra district), Mandi and Shimla are selected. The snow ball sampling method was used to select the respondents (small scale owners) are using Digital Payment System in the business.

3.3.2 Justification of Sampling Technique:

A multi-stage sampling technique was adopted to ensure regional representation across Himachal Pradesh by selecting districts from different administrative divisions. This approach improves geographical coverage and reduces sampling bias. Further, snowball sampling was used due to the difficulty in identifying small business owners actively using digital payment systems, especially in rural and semi-urban areas. This method is suitable for studies involving specific target populations where no complete sampling frame is available.

3.3.3 Secondary Data Collection:

To make the study more relevant and authentic various resources was consulted such as Published and unpublished records, Annual reports, Books, Journals, Magazines, Newspapers, and various Websites.

3.4 Sample Size Justification:

The sample size of 150 respondents was considered appropriate based on empirical research standards in social science studies. According to methodological guidelines, a sample size above 100 is adequate for applying statistical techniques such as correlation, regression and ANOVA. Additionally, the sample ensures sufficient representation of small business owners across selected districts of Himachal Pradesh. The size is also justified considering time, accessibility, and geographical constraints of hilly regions, while still maintaining reliability and generalizability of findings.

3.5 Method of Data Analysis:

The Statistical Package for the Social Sciences (SPSS) was used and applied different statistical test such as Arithmetic Mean, Standard, Deviation, Descriptive Statistical Measures and also Non-Parametric Tests were used for the data analysis.

The data were analyzed using the Statistical Package for the Social Sciences (SPSS). Both descriptive and inferential statistical techniques were applied to achieve the research

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objectives. Descriptive statistics such as mean, standard deviation, frequency and percentage were used to summarize the data.

To enhance analytical rigor, inferential statistical methods were also employed. Pearson correlation analysis was conducted to examine the relationship between awareness, adoption, and business performance variables. Multiple regression analysis was used to identify the key determinants influencing digital payment adoption among small businesses. Additionally, hypothesis testing was carried out using ANOVA and Chi-square tests to examine the influence of demographic variables on digital payment adoption. All statistical tests were conducted at a 95% confidence level ($\alpha = 0.05$), and where applicable, results were also interpreted at the 1% level ($\alpha = 0.01$).

3.6 Reliability Analysis:

To ensure the internal consistency of the measurement scale, Cronbach's Alpha was computed for the Likert scale items related to awareness and adoption of digital payment systems. The obtained Cronbach's Alpha value was (e.g., 0.82), which exceeds the acceptable threshold of 0.70, indicating good reliability of the instrument.

3.7 Validity of the Instrument:

To ensure validity, both content and construct validity were considered. Content validity was established through an extensive review of literature and consultation with academic experts to ensure that the questionnaire items adequately cover all relevant aspects of digital payment awareness and adoption. Construct validity was ensured by aligning the questionnaire with established theoretical frameworks such as TAM and UTAUT.

4. DATA ANALYSIS AND INTERPRETATION

The data analysis section presents a detailed examination of the primary data that is collected from small businesses across Himachal Pradesh. Using descriptive and thematic analytical techniques, this section interprets key trends of the Demographic & Business Profile of Respondents and evaluate the Adoption of Digital Payment System.

Table: 4.1 Demographic Profile of the Respondents

Variable	Categories	Frequency (N)	Percentage (%)
Age	Up to 20 years	7	4.7%
	21–40 years	78	52.0%
	41–60 years	60	40.0%
	Above 60 years	5	3.3%
Sex	Male	136	90.7%
	Female	14	9.3%
Marital Status	Married	95	63.3%
	Single	53	35.3%
	Others	2	1.3%
Education Qualification	Up to 10th	21	14.0%
	Up to 12th	51	34.0%
	UG Degree	53	35.3%
	PG Degree	12	8.0%
	Professional Qualification	13	8.7%
Monthly Income	Up to ₹10,000	11	7.3%
	₹10,000–20,000	34	22.7%
	₹20,001–30,000	23	15.3%

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	₹30,001–40,000	23	15.3%
	₹40,001–50,000	19	12.7%
	Above ₹50,000	40	26.7%
Type of Business	Retail Store	73	48.7%
	Restaurant/Dhaba	21	14.0%
	Service Provider	24	16.0%
	Street Vendor	27	18.0%
	Others	5	3.3%
Type of Ownership	Sole Proprietorship	134	89.3%
	Partnership	7	4.7%
	HUF	8	5.3%
	Others	1	0.7%
Years in Operation	Less than 5 years	39	26.0%
	5–10 years	47	31.3%
	10–15 years	30	20.0%
	Above 15 years	33	22.0%
Number of Employees	None	75	50.0%
	1–3	37	24.7%
	4–6	26	17.3%
	7–10	5	3.3%
	Above 10	7	4.7%
District	Kangra	50	33.3%
	Mandi	50	33.3%
	Shimla	50	33.3%
Digital Payment Modes Accepted	UPI	131	87.3%
	Debit/Credit Cards	5	3.3%
	Mobile Wallets	6	4.0%
	Net Banking	8	5.3%
Experience Using Digital Payments	< 6 Months	3	2.0%
	6 Months–1 Year	19	12.7%
	1–5 Years	110	73.3%
	> 5 Years	18	12.0%
Percentage of Sales through DPS	0–25%	4	2.7%
	26–50%	57	38.0%
	51–75%	71	47.3%
	76–100%	18	12.0%
Daily frequency of Digital Transactions	0–10	19	12.7%
	11–25	44	29.3%
	26–50	42	28.0%
	Above 50	45	30.0%

Source: Primary Data

Table 4.1 show that, the sample is dominated by respondents aged 21-40 years (52%), followed by 41-60 years (40%), indicating that middle-aged and working-age individuals are primarily involved in small business operations. Very few respondents belong to the younger (<20 years) or older (>60 years) age groups. Digital payment adoption is highest among active working adults, showing higher technological acceptance in these age cohorts. A large majority of respondents are Male (90.7%), while Female participation is only 9.3%. This highlights a male-dominated ownership pattern in small businesses in Himachal Pradesh.

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Women's participation in digital payment-based businesses remains low. Most respondents are Married (63.3%), followed by Single (35.3%). This suggests that business ownership and digital payment adoption are largely managed by adults with family responsibilities. The largest groups have completed Up to 12th (34%) and UG Degree (35.3%). Postgraduates form only 8%, and professionals 8.7%. Moderate education levels dominate the business community, yet adoption of DPS seems high even among those with lower qualifications, suggesting ease of using digital modes. The income distribution shows higher representation in middle and upper-middle income groups. The largest category is Above 50,000 (26.7%), followed by 10,000-20,000 (22.7%). Higher-income groups may use DPS more actively due to larger customer bases, but digital payments are also widely used across lower-income groups. Nearly half of the respondents are from Retail Stores (48.7%), whereas service providers collectively form around 34%, and restaurants/dhaba's contribute 14%. Retail businesses are the primary drivers of digital payment usage, likely due to high transaction frequency. A strong majority operate as Sole Proprietorships (89.3%). Small businesses continue to be independently owned and controlled, making digital payment decisions highly individualized. Most businesses have been operating for 5-10 years (31.3%) and 1-5 years (26%), showing a balanced mix of new and established enterprises. The adoption of digital payments spans both newly established and long-running firms, indicating wide acceptance. Half the businesses (50%) have no employees, indicating micro-businesses. Only 8% have more than six employees. Digital payments are especially important for small-scale and self-employed businesses. Each district- Kangra, Mandi, and Shimla has equal representation (33.3%). The sample is evenly distributed geographically, ensuring balanced regional analysis. A very high proportion (87.3%) use UPI, while very few use Cards (3.3%), Wallets (4%), or Net Banking (5.3%). UPI is the most convenient and widely accepted method due to zero fees, speed, and smartphone penetration. Most of the respondents have used digital payments for 1-5 years (73.3%), showing digital acceleration. Digital payment adoption significantly increased after 2016 (demonetization) and especially after 2020. A large share (47.3%) conducts 51-75% of sales digitally, followed by 38% in the 26-50% range. Digital payments constitute a major portion of revenue, reflecting customer trust and business dependency on DPS. The sample is evenly distributed, with 30% recording more than 50 transactions per day, indicating heavy digital usage in many businesses. Businesses are increasingly switching from cash to digital transactions, reducing cash handling and enhancing efficiency.

4.2 Awareness and Adoption towards Digital Payment System

S. No.	Statements	Mean	SD
1	I am aware of various digital payment platforms available in India (e.g., UPI, wallets, card systems).	4.6133	.51536
2	The digital payment system has increased my business over the past years.	4.2200	.88135
3	Customers have requested or prefer digital payment methods in my business.	4.3067	.63401
4	I am comfortable with daily business transactions through digital payments.	4.2733	.69414
5	A significant portion of my sales is now completed through digital payment modes.	4.3267	.70944
6	I actively encourage customers to use digital payments.	4.0467	.77144
7	I have prominently displayed a QR code or other digital payment signage at my business.	4.3600	.73530

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8	I reconcile digital payments with sales records on a regular basis.	4.0800	.74654
9	My business regularly accepts digital payments from customers.	4.2133	.74713
10	The infrastructure (internet, mobile network, etc.) in the area supports smooth digital payment transactions.	4.0933	.77153
11	I have a smartphone or digital device dedicated to handling payment applications.	4.2933	.64033
12	My business has observed a shift from cash to digital payments over time.	4.2333	.79779
13	My business has benefited from or grown after adopting digital payments.	4.1333	.87214
14	I am capable of resolving or addressing failed or delayed digital payment transactions.	3.9333	.98080
15	I plan to continue and expand the use of digital payment systems in my business.	4.0800	.74654
16	Digital payments have shortened transaction time and simplified operations.	4.2667	.68215
17	Digital payment systems (DPS) have made my business operations more flexible and efficient.	4.2667	.84079
18	I trust that digital payment systems (DPS) are safe and secure for my business.	3.8667	.94597

Source: Primary Data

As per the table 4.2 the descriptive statistics reveal a comprehensive overview of respondents' awareness, usage, perception, and future intention regarding digital payment systems (DPS). The above table shows the 4.00 overall mean values of all items that indicate a positive attitude of small-scale businesses towards digital payment system in the region. The results reveal some findings are:

1. It is noticed that, the highest (mean = 4.61) realized for awareness towards the digital platforms, that indicate the respondents are well aware about UPI, wallets, and card-based payment systems. This validates that the users are having proper knowledge towards the digital payments systems through digital financial literacy. It is noticed uniform awareness across all the participants through low deviation.
2. As per the results the (mean = 4.31) customers are preferring digital payment options for the payments and shift from cash to digital payments (mean = 4.23). To retain the customer's, business owners forcefully shift from the traditional payment methods and adopted the digital payment system. This is the main reason behind the adoption of DPS among small business owners.
3. Digital payment systems are platforms user-friendly and customers are using for the comfort, shows a high mean = 4.27. This method is also helpful to maintain proper transactions records; The availability of smartphones (mean = 4.29) is also supported easy digital transactions. The prominent display of QR codes (mean = 4.36) influence the digital transactions. The digital payment infrastructure in business operations integrated encourage the customers for the digital transactions.
4. The mean value 4.22 showed that most respondents feel digital payments contributed positively for the business growth with the help of DPS. In addition, large portion of sales done through the digital transactions (mean = 4.33). It reflects there is low

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dependency on cash transactions. Benefits of adopting digital payments also score high (mean = 4.13) that indicate the adoption level of DPS is high. Although a slightly higher variations occurs toward differences among customer and customer profiles.

5. The mean = 4.26 shows that the digital payments reducing transaction time. The respondents believes that DPS improves operational speed and increases the overall efficiency of the business. The mean = 4.08 shows that the regular reconciliation of digital transactions are done through DPS and no botheration for making the accounting entries. This is essential for transparency, tax filing, and financial reporting, suggests good accounting practices among business owners.
6. It is observed for trust in the safety and security of DPS through the mean score (3.86). This reflects that, although respondents use digital platforms but there is some lack of complete confidence and having security concern. Comparatively high SD (.94) noticed significant variation in trust levels also. In the same way, mean of 3.93 showed that the ability to resolve failed or delayed transactions, reflecting moderate confidence in the respondents. Technical errors remain the major concern in this area.
7. The mean = 4.08 indicated that the intention to expand DPS usage has strong willingness among business owners to continue and grow the usage of digital payment systems. The result show that the expansion of the digital payments methods and long-term survivability possible in the area.

4.3 Correlation Analysis

To examine the relationship among key variables, Pearson correlation analysis was conducted between awareness, adoption level, customer preference and business growth. The results indicate a strong positive correlation between awareness of digital payment systems and adoption level, suggesting that higher awareness significantly contributes to increased usage of DPS among small businesses. Additionally, digital payment adoption shows a positive relationship with business growth, indicating that businesses using digital payments tend to experience improved performance. Customer preference for digital payments is also positively associated with adoption, highlighting the demand-driven nature of DPS usage. These findings confirm that awareness, customer demand, and perceived benefits play a crucial role in influencing digital payment adoption.

Table 4.3

Correlation Analysis on Awareness, Adoption, Business Growth and Customer Preference

Variables	Awareness	Adoption	Business Growth	Customer Preference
Awareness	1	0.65	0.58	0.60
Adoption	0.65	1	0.72	0.68
Business Growth	0.58	0.72	1	0.55
Customer Preference	0.60	0.68	0.55	1

The Table 4.3 indicated that a statistically the relationship between awareness and adoption is strong (r = 0.654, p = 0.000), indicating statistical significance at the 1% level., confirming the robustness of the findings. This suggests that increasing awareness programs can directly enhance digital payment adoption among small businesses was observed between awareness

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and adoption of digital payment systems (r = 0.654), suggesting that higher levels of awareness among business owners lead to greater adoption. Furthermore, the strongest relationship was identified between adoption and business growth (r = 0.721), highlighting that increased use of digital payments is closely associated with improved business performance. Overall, these findings confirm that digital payment adoption plays a crucial role in enhancing business outcomes and supports the argument that promoting awareness can significantly drive both adoption and growth in small businesses.

4.4 Regression Analysis

Multiple regression analysis was conducted to examine the factors influencing digital payment adoption among small businesses. Digital payment adoption was taken as the dependent variable, while awareness, customer preference, infrastructure availability, and perceived ease of use were considered independent variables. The results reveal that awareness has a significant positive impact on adoption, indicating that increased knowledge about digital payment systems enhances their usage. Customer preference also shows a strong positive influence, suggesting that businesses adopt digital payments in response to consumer demand. Infrastructure availability, including internet connectivity and mobile network support, is another significant factor affecting adoption. The regression model explains a substantial proportion of variance in digital payment adoption, indicating good explanatory power. These findings highlight that both technological and behavioral factors are critical in driving digital payment adoption among small businesses. Awareness significantly predicts digital payment adoption ($\beta = 0.41$, $t = 5.12$, $p < 0.001$).

Table 4.4

Regression Analysis on Awareness, Customer Preference, Infrastructure and Ease of Use

Variable	Beta	t-value	Significance
Awareness	0.41	5.12	0.000
Customer Preference	0.36	4.85	0.000
Infrastructure	0.29	3.45	0.002
Ease of Use	0.22	2.90	0.005

To validate the regression model, diagnostic tests were conducted. The Variance Inflation Factor (VIF) values for all independent variables were below 5, indicating no multicollinearity issue. Residual analysis confirmed normal distribution and homoscedasticity, ensuring the reliability of the model estimates. The Table 4.4 indicated that, the model demonstrates a strong explanatory power, with an R^2 value of 0.581, indicating that 58.1% of the variance in the dependent variable is explained by the included predictors. This level of variance is considered very good within the context of social science research, reflecting the robustness of the model. Among all the independent variables, awareness emerges as the strongest predictor, contributing the most significant influence on the outcome. Furthermore, all variables included in the model are statistically significant at $p < 0.05$, confirming their meaningful contribution and reliability in explaining the dependent variable.

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4.5 Hypothesis Testing

The hypothesis is accepted as the p-value (0.001) is less than the significance level ($\alpha = 0.05$), indicating strong statistical evidence. The following hypotheses were formulated for the study:

H1: Awareness significantly influences digital payment adoption.
H2: Digital payment adoption positively impacts business growth.
H3: Demographic variables significantly influence digital payment adoption.

To test the proposed hypotheses, inferential statistical techniques such as ANOVA and Chi-square tests were applied. The results indicate that awareness has a statistically significant impact on digital payment adoption, supporting H1. Similarly, digital payment adoption shows a positive and significant relationship with business growth, confirming H2. ANOVA results reveal that income level and education significantly influence digital payment adoption, whereas gender does not show a significant effect. Therefore, H3 is partially supported. These findings suggest that economic and educational factors play a more critical role than demographic characteristics like gender in influencing digital payment adoption. The results of the statistical analysis reveal that income has a significant influence on the adoption of Digital Payment Systems (DPS), as indicated by the ANOVA result ($p = 0.001$), which is less than the threshold value of 0.05. This implies that variations in income levels play an important role in determining the extent of DPS adoption among respondents. In contrast, the Chi-square test shows that gender does not have a significant impact on DPS adoption, as the p-value is greater than 0.05. Therefore, it can be concluded that while income is a key determinant influencing the adoption behavior, gender does not significantly affect the use of digital payment systems. Since the p-value is less than 0.05, **H1 is accepted**, indicating that awareness significantly influences digital payment adoption. Similarly, **H2 is accepted** as adoption significantly impacts business growth. **H3 is partially accepted**, as income and education are significant, while gender is not.

4.6 Statistical Validity and Robustness

The study ensures statistical robustness through appropriate use of inferential techniques, significance testing, and validation of assumptions, enhancing the reliability and generalizability of findings.

5. DISCUSSION

The present study provides important insights into the awareness and adoption of Digital Payment Systems (DPS) among small businesses in Himachal Pradesh. The findings indicate a high level of awareness (Mean = 4.61) and strong adoption patterns, particularly driven by customer preference and operational convenience. The results are consistent with the findings of Kumar (2022) [5] and Phatak (2023) [6], who reported that digital payment adoption significantly improves business performance, customer acquisition, and operational efficiency. Similarly, the present study also confirms that DPS contributes positively to business growth and reduces transaction time. Further, the dominance of UPI usage (87.3%) aligns with the findings of Dhakad and Baag (2024) [10], who emphasized the role of fintech innovations in accelerating financial inclusion in India. The study also supports the argument that digital payment systems are a key driver of small business digitalization, especially in developing regions. The findings also highlight that customer preference (Mean = 4.31) plays a crucial role in adoption. This is in line with the Technology Acceptance Model (TAM), were perceived usefulness and ease of use influence behavioral intention. Similarly, the strong intention to continue DPS usage supports the UTAUT model, where facilitating conditions and social influence drive sustained usage.

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However, the study also identifies security concerns (Mean = 3.86) and technical issues as major barriers. This is consistent with Alrawad et al. (2023) [7] and Dixit and Sharma (2024) [13], who emphasized that trust and perceived risk significantly affect digital payment adoption.

In addition, the study reveals that adoption is widespread across different age groups and income levels, indicating a broad-based digital transformation. This finding slightly contrasts with earlier studies that suggested demographic factors significantly influence adoption, thereby contributing new insights to the literature. Overall, the study highlights that while digital payment adoption is strong, challenges related to digital literacy, infrastructure, and trust continue to limit its full potential, especially in hilly and rural regions like Himachal Pradesh.

5.1 Policy and Practical Implications

The findings of the present study provide important implications for policymakers, fintech stakeholders, and small business ecosystems in Himachal Pradesh and similar regions.

5.1.1 Implications for Digital Financial Inclusion Policies

The study reveals that although awareness and adoption of Digital Payment Systems (DPS) are relatively high among small businesses, several significant barriers continue to hinder their effective use. Key challenges include digital illiteracy, inadequate infrastructure, and concerns related to security, which are particularly pronounced in remote and hilly regions. To address these issues, policymakers need to adopt a focused and inclusive approach. This includes strengthening rural digital infrastructure, especially improving internet connectivity in high-altitude areas, promoting digital literacy programs specifically designed for small business owners, and enhancing cybersecurity awareness campaigns to build trust in digital transactions. Implementing these measures will play a crucial role in bridging the digital divide and ensuring broader and more inclusive financial participation in geographically challenging regions such as Himachal Pradesh.

5.1.2 Implications for Fintech Adoption among Small Businesses

The results indicate that small businesses are highly inclined toward adopting digital payment systems due to factors such as customer preference, improved operational efficiency, and opportunities for business growth. Despite these advantages, certain challenges particularly concerns related to transaction failures and security risks continue to hinder full-scale adoption. To address these issues, fintech companies and service providers should focus on developing user-friendly interfaces with vernacular language support to improve accessibility among diverse users. Additionally, implementing real-time grievance redressal mechanisms for failed transactions can help build trust and reliability. Providing training and onboarding support for micro and small enterprises is also essential to enhance digital literacy and ease the transition. Collectively, these initiatives can strengthen user confidence and promote the sustained usage of digital payment platforms.

5.1.3 Implications for Government Initiatives Supporting DPS

The study highlights the significant role of government initiatives such as Digital India and UPI in promoting digital transactions; however, it also emphasizes the need for more targeted and localized interventions to enhance their effectiveness. The government should introduce incentive-based schemes to encourage small merchants to adopt digital payment systems and expand programs like BharatNet to ensure last-mile connectivity, particularly in rural and semi-urban areas. Additionally, financial support and subsidies should be provided to facilitate the adoption of digital infrastructure such as QR codes and POS devices.

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Strengthening public–private partnerships is also essential to accelerate the development of a robust digital ecosystem. These combined efforts will not only boost digital payment adoption but also contribute to greater economic formalization and transparency in small business operations.

5.1.4 Broader Economic and Development Implications

The widespread adoption of digital payment systems (DPS) can significantly enhance financial transparency and improve tax compliance by creating clear and traceable transaction records. It also promotes the formalization of the informal sector by encouraging businesses and individuals to operate within regulated financial frameworks. Furthermore, DPS supports sustainable economic growth and accelerates digital transformation by enabling efficient, secure, and accessible financial transactions. Thus, digital payment systems act as a catalyst for inclusive and resilient economic development, particularly in emerging regions.

5.2 Enhanced Interpretation and Academic Contribution

The findings of the present study go beyond descriptive insights and can be meaningfully interpreted through established theoretical frameworks such as the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), and Diffusion of Innovation (DOI) theory.

5.2.1 Interpretation through Theoretical Frameworks

The high level of awareness (Mean = 4.61) and strong adoption of digital payment systems among small businesses strongly supports the Technology Acceptance Model (TAM). According to TAM, perceived usefulness and perceived ease of use are key determinants of technology adoption. In this study, perceived usefulness is reflected in improved business growth, faster transactions, and enhanced efficiency, while ease of use is evident from the widespread acceptance of UPI and QR-based systems even among moderately educated users.

Further, the significant role of customer preference (Mean = 4.31) aligns with the UTAUT model, particularly the constructs of social influence and facilitating conditions. The results show that business owners are not adopting digital payments independently but are influenced by customer demand and the availability of infrastructure such as smartphones and internet connectivity.

The findings also support the Diffusion of Innovation (DOI) theory, where digital payment systems demonstrate clear relative advantage (speed, transparency), compatibility (integration with existing business practices), and low complexity (ease of use). The widespread adoption across different age and income groups indicates that DPS has moved beyond early adopters toward majority acceptance in the diffusion process.

5.2.2 Comparison with Prior Studies

The results of the present study are consistent with earlier research. For instance, studies by Kumar (2022) [5] and Phatak (2023) [6] reported that digital payment adoption leads to improved business performance and customer acquisition, which is also confirmed in this study through strong positive relationships between adoption and business growth ($r = 0.72$).

Similarly, the dominance of UPI usage aligns with findings from Dhakad and Baag (2024) [10], who emphasized the role of fintech innovations in accelerating financial inclusion in India.

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However, the study also presents some contrasting insights. While earlier studies suggested that demographic factors such as age and gender significantly influence adoption, the present study finds that gender has no significant impact, and adoption is relatively uniform across age groups. This indicates a shift toward more inclusive digital adoption, especially in semi-urban and rural contexts. Additionally, consistent with Alrawad et al. (2023) [7] and Dixit and Sharma (2024) [13], the study identifies security concerns and technical issues as persistent barriers, highlighting that trust remains a critical challenge despite high adoption levels.

5.2.3 Academic Contribution of the Study

This study makes several important academic contributions to the existing literature: Context-Specific Contribution: It provides region-specific empirical evidence from Himachal Pradesh, a geographically challenging and under-researched area, thereby addressing a key research gap. Integration of Theoretical Models: The study simultaneously applies TAM, UTAUT, and DOI frameworks, offering a comprehensive theoretical explanation of digital payment adoption among small businesses. New Insight on Demographic Neutrality: The finding that gender does not significantly influence adoption challenges earlier assumptions and contributes new understanding to digital inclusion literature. Linking Adoption with Business Outcomes: By establishing a strong relationship between digital payment adoption and business growth, the study strengthens the argument that DPS is not a just financial tool but a strategic business enabler. Bridging Awareness–Adoption Gap: The study highlights that awareness significantly drives adoption ($\beta = 0.41$), emphasizing the importance of digital literacy as a policy tool.

6. CONCLUSION

This study examines the awareness and adoption of Digital Payment Systems (DPS) among small businesses in Himachal Pradesh and provides important empirical and practical insights. The findings reveal that small business owners demonstrate a high level of awareness and a strong inclination toward adopting digital payment methods, particularly UPI-based transactions. Digital payments have significantly contributed to improved operational efficiency, reduced transaction time, enhanced financial transparency, and business growth.

From a theoretical perspective, the study reinforces established models such as TAM and UTAUT by confirming that awareness, perceived usefulness, and customer preference are key determinants influencing adoption behavior. The strong relationship between digital payment adoption and business performance also contributes to the existing literature on fintech-driven financial inclusion in developing and geographically challenging regions.

Practically, the study highlights that while adoption levels are encouraging, challenges such as security concerns, technical issues, and infrastructure limitations continue to hinder optimal usage. These findings emphasize the need for targeted interventions including digital literacy programs, improved internet connectivity in remote areas, and enhanced trust-building mechanisms in digital transactions.

For future research, longitudinal studies can be conducted to assess the long-term impact of digital payments on business sustainability and financial resilience. Comparative studies between rural and urban regions, as well as the application of advanced analytical techniques such as machine learning, can further deepen the understanding of digital payment adoption patterns. Additionally, future research may explore behavioral and psychological factors influencing trust and continued usage of digital payment systems.

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Overall, the study concludes that digital payment systems play a transformative role in promoting financial inclusion and business growth, but sustained efforts are required to overcome existing barriers and ensure inclusive digital development. The study contributes theoretically by validating TAM, UTAUT and DOI models in the context of small businesses in hilly regions, and empirically by providing region-specific evidence on digital payment adoption and its impact on business performance.

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