

Digital Payment Adoption and Operational Cost Reduction in Small Businesses

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Abstract

This study examined the relationship between digital payment adoption and operational cost reduction among small businesses in Paete, Pakil, Lumban, Siniloan, and Pagsanjan, Laguna. A mixed-methods approach involved a survey of 120 small business owners and interviews with selected participants. Parameters evaluated include demographic profiles, architectural deployment metrics (security, convenience, accessibility, and user acceptance), and operational cost factors. Quantitative data were analyzed using descriptive statistics, the Chi-Square Test of Independence, and Spearman's rank-order correlation, while qualitative data underwent thematic analysis. Chi-square independence testing indicated no structural relationships between profile variables and technology adoption. Conversely, merchant age, formal education levels, and monthly revenues displayed highly significant linkages ($p < 0.001$) to localized cost reductions.

All four dimensions of digital payment adoption were positively and significantly associated with operational cost reduction, with user acceptance showing the strongest relationship. Qualitative findings indicated that digital payments supported faster transactions, reduced cash handling, and minimized travel time and expenses, although internet expenses and transaction fees remained challenges. Overall, digital payment adoption was significantly associated with operational cost reduction among participating small businesses. These findings may guide business owners and payment providers in improving digital payment practices while providing a foundation for future research on digital payment adoption and operational efficiency in rural communities.

Keywords: digital payment adoption; operational cost reduction; small businesses; user acceptance

1 Introduction

Digital payment systems have become increasingly common in business transactions, offering small businesses alternative ways to receive and make payments. Through mobile wallets, online banking, electronic fund transfers, and QR-based payments, business owners can process transactions and manage financial activities without relying solely on cash.

Digital payment adoption may provide operational benefits for small businesses. These systems may help simplify transactions, reduce manual record-keeping, minimize cash handling, and lessen the time and transportation expenses associated with certain financial activities. However, digital payments may also involve transaction fees, internet expenses, and other technology-related costs.

Operational cost reduction reflects the extent to which businesses manage and minimize expenses associated with their daily activities. For small businesses, efficient transaction processing, reduced cash handling, and less time spent on financial tasks are important considerations in managing limited resources and maintaining daily operations.

However, adopting digital payment systems does not necessarily guarantee lower operational costs. Businesses may experience different benefits and challenges depending on their resources, technological accessibility, and payment-related expenses. Further localized research is needed to understand how digital payment adoption relates to operational cost reduction among small businesses in rural communities.

This study examines the relationship between digital payment adoption and operational cost reduction among small businesses in Pagsanjan, Lumban, Paete, Pakil, and Siniloan, Laguna. Specifically, it assesses digital payment adoption in terms of security, convenience, accessibility, and user acceptance. It examines its relationship with operational cost reduction, providing localized evidence on digital payment practices among small businesses.

2 Methods

This study employed a convergent parallel mixed-methods design to examine the relationship between digital payment adoption and operational cost reduction among small businesses. As described by Creswell and Plano Clark [3], this design involves collecting and analyzing quantitative and qualitative data separately and integrating the findings during interpretation to develop a more comprehensive understanding of the research problem. This approach allowed the study to combine statistical findings with insights into business owners' experiences and perceptions of digital payment systems.

The study was conducted in five selected municipalities in Laguna, Philippines: Pagsanjan, Lumban, Paete, Pakil, and Siniloan. The quantitative phase involved 120 small business owners selected through purposive sampling, while the qualitative phase included five separately selected small business owners who shared their experiences and challenges in using digital payment systems in their daily operations.

Data were collected through structured questionnaires administered in printed and online formats and face-to-face interviews. Quantitative data were analyzed using frequency, percentage, weighted mean, the Chi-Square Test of Independence, and Spearman's rank-order correlation. Qualitative data were analyzed using thematic analysis. Findings from both phases were integrated during interpretation to provide a broader understanding of the relationship between digital payment adoption and operational cost reduction.

3 Results and discussion

3.1 Profile of the respondents

The findings showed that most respondents were aged 31–40 years, with females outnumbering males. In terms of educational attainment, college-level respondents comprised the largest group, followed by college graduates and junior high school graduates. Most respondents reported monthly business revenue below ₱50,000, while the largest group had operated their businesses for two to four years, followed by those with five to ten years of operation. These findings summarized the respondents' demographic, educational, and business characteristics, providing an overview of the participating small business owners.

Overall, the findings described the age, sex, educational attainment, monthly business revenue, and operating experience of small business owners in Pagsanjan, Lumban, Paete, Pakil, and Siniloan,

Laguna. The predominance of respondents earning below ₱50,000 monthly highlighted the concentration of participating businesses within the lowest revenue category. In contrast, the distribution of business operating years reflected varying levels of business experience. These characteristics provided context for examining digital payment adoption and its relationship with operational cost reduction among small businesses in the selected municipalities.

Table 1 summarizes the extent of digital payment adoption across its four dimensions.

Table 1. Extent of digital payment adoption.

Aspect	Mean	SD
Security	3.54	0.41
Convenience	3.55	0.37
Accessibility	3.36	0.36
User Acceptance	3.51	0.35

Based on the results, Convenience received the highest mean score of 3.55 (SD = 0.37), indicating that respondents value the convenience of digital payment platforms. Security followed with a mean of 3.54 (SD = 0.41), while User Acceptance scored 3.51 (SD = 0.35), reflecting favorable perceptions of digital payment adoption. Lastly, Accessibility obtained the lowest mean of 3.36 (SD = 0.36), suggesting that it remains a comparatively less favorable aspect among small businesses.

The results of the Extent of Digital Payment Adoption in terms of Security can be seen in **Table 2**.

Table 2. Extent of digital payment adoption in terms of security.

Statement	Weighted mean	Interpretation
<i>I...</i>		
1. Ensure that the digital payment platforms used in the business provide secure transactions.	3.58	Strongly Agree
2. Safeguard customer and business information by using systems with strong security features	3.58	Strongly Agree
3. Verify the security of digital payment platforms before using them.	3.51	Strongly Agree
4. Rely on digital payment systems that apply security measures such as encryption and authentication.	3.53	Strongly Agree
5. Avoid using digital payment platforms that appear vulnerable to fraud or unauthorized access.	3.48	Strongly Agree
Overall mean	3.54	Strongly Agree

Table 2 shows the extent of digital payment adoption in terms of security. The highest mean (3.58) indicates that respondents prioritize secure transactions and the protection of customer and business information. The mean of 3.53 highlights the importance of security measures such as encryption and authentication. Other practices, such as verifying platform security (3.51) and avoiding platforms vulnerable to fraud (3.48), also contribute to secure digital payment use. Overall,

the mean of 3.54 suggests that security is an important aspect of digital payment adoption among small businesses.

The results of the Extent of Digital Payment Adoption in terms of Convenience can be seen in Table 3.

Table 3. Extent of digital payment adoption in terms of convenience.

Statement	Weighted mean	Interpretation
<i>I...</i>		
1. Use digital payment systems to speed up transactions with customers.	3.59	Strongly Agree
2. Simplify daily business operations through the use of digital payment platforms.	3.60	Strongly Agree
3. Reduce the time spent processing payments by using digital methods.	3.53	Strongly Agree
4. Manage transactions more efficiently when using digital payments compared to cash.	3.45	Strongly Agree
5. Experience smoother and more convenient payment processes when using digital systems.	3.57	Strongly Agree
Overall mean	3.55	Strongly Agree

Table 3 shows the extent of digital payment adoption in terms of convenience. Simplifying daily business operations received the highest mean of 3.60, highlighting the value of digital payment platforms in making business activities easier. Speeding up transactions with customers ranked second, with a mean of 3.59, emphasizing the importance of faster payment processing. Smoother payment processes obtained a mean of 3.57, while reducing payment processing time received a mean of 3.53. Meanwhile, managing transactions more efficiently than cash received the lowest mean of 3.45. Overall, the mean of 3.55 suggests that convenience is an important aspect of digital payment adoption among small businesses.

The results of the Extent of Digital Payment Adoption in terms of Accessibility can be seen in Table 4.

Table 4. Extent of digital payment adoption in terms of accessibility.

Statement	Weighted mean	Interpretation
<i>I...</i>		
1. Can access digital payment platforms anytime and anywhere for my business.	3.33	Strongly Agree
2. Use digital payment systems across different devices without difficulty.	3.27	Strongly Agree
3. Complete transactions using digital platforms with minimal technical problems.	3.37	Strongly Agree
4. Find digital payment platforms easy to navigate and understand.	3.56	Strongly Agree
5. Depend on digital payment systems for consistent and uninterrupted transactions.	3.29	Strongly Agree
Overall mean	3.36	Strongly Agree

Table 4 shows the extent of digital payment adoption in terms of accessibility. Finding digital payment platforms easy to navigate and understand received the highest mean of 3.56, highlighting the importance of user-friendly platforms. Completing transactions with minimal technical problems obtained a mean of 3.37, reflecting the need for reliable payment processes. Accessing platforms anytime and anywhere received a mean of 3.33, while consistent and uninterrupted transactions received a mean of 3.29. Meanwhile, using digital payment systems across different devices received the lowest mean of 3.27. Overall, the mean of 3.36 suggests that accessibility is an important aspect of digital payment adoption among small businesses.

The results of the Extent of Digital Payment Adoption in terms of User Acceptance can be seen in Table 5.

Table 5. Extent of digital payment adoption in terms of user acceptance.

Statement	Weighted mean	Interpretation
<i>I...</i>		
1. Adopt digital payment systems in my business transactions willingly.	3.55	Strongly Agree
2. Trust the usefulness of digital payment systems for my business operations.	3.59	Strongly Agree
3. Feel comfortable using digital payment platforms for daily transactions.	3.57	Strongly Agree
4. Prefer digital payment systems over cash transactions whenever possible.	3.32	Strongly Agree
5. Continue using digital payment systems in my business in the future.	3.53	Strongly Agree
Overall mean	3.51	Strongly Agree

Table 5 shows the extent of digital payment adoption in terms of user acceptance. Trusting the usefulness of digital payment systems for business operations received the highest mean of 3.59, highlighting respondents' confidence in their benefits. Feeling comfortable using digital payment platforms ranked second, with a mean of 3.57, followed by willingly adopting digital payments with a mean of 3.55. Continuing to use digital payment systems in the future obtained a mean of 3.53, while preferring digital payments over cash whenever possible received the lowest mean of 3.32. Overall, the mean of 3.51 suggests that user acceptance is an important aspect of digital payment adoption among small businesses.

Presented below are the statements gathered from the small business owners during the interviews regarding digital payment adoption in terms of security, convenience, accessibility, and user acceptance:

- **SB1:** Emphasizes faster supplier transactions and utility bill payments through digital methods, while still preferring cash for small-value transactions.
- **SB2:** Highlights how digital payments make receiving customer payments easier despite distance and help expand the business's market reach beyond its physical location.
- **SB3:** Describes digital payments as faster and more convenient than remittance services, while emphasizing security features such as authentication and one-time passwords (OTPs).
- **SB4:** Highlights faster delivery and supplier transactions by reducing the need to carry cash, prepare change, and meet customers physically.
- **SB5:** Emphasizes the growing importance of digital payments, transaction security, and offering flexible payment options as more customers adopt digital methods.

The business owners highlighted the usefulness of digital payments in their daily operations. SB1, SB3, and SB4 emphasized faster and more convenient transactions, particularly for supplier payments, utility bills, and deliveries. They also noted that digital payments reduced the effort involved in handling cash and completing transactions physically. SB2 highlighted the accessibility of receiving payments from distant customers, while SB5 emphasized transaction security and flexible payment options. However, SB1's continued preference for cash in small-value transactions showed that traditional payment methods remained relevant to certain business needs.

The results of the Level of Operational Cost Reduction in Small Businesses can be seen in [Table 6](#).

Table 6. Level of operational cost reduction in small businesses.

Statement	Weighted mean	Interpretation
1. Perceive that digital payment systems help reduce losses from fraud or unauthorized transactions.	3.42	Strongly Agree
2. Experience fewer errors in financial records when handling transactions digitally.	3.28	Strongly Agree
3. Rely on digital payment systems to protect my business from potential financial losses due to system breaches.	3.39	Strongly Agree
4. Complete transactions faster when using digital payment systems.	3.47	Strongly Agree
5. Manage daily financial operations more easily through digital payment platforms.	3.51	Strongly Agree
6. Spend less time on bookkeeping by using digital payment systems.	3.33	Strongly Agree
7. Can conduct business transactions anytime and anywhere using digital payment systems.	3.53	Strongly Agree
8. Consistently access digital payment platforms with minimal interruptions during operations.	3.41	Strongly Agree
9. Continue using digital payment systems due to ease and practicality in business operations.	3.45	Strongly Agree
10. Prefer digital payment systems because they improve transaction efficiency.	3.54	Strongly Agree

The findings indicated that respondents generally viewed digital payment systems favorably in terms of operational cost reduction. Improving transaction efficiency received the highest mean of 3.54, emphasizing the perceived value of digital payments in making business transactions more efficient. Accessibility and easier management of daily financial operations were also highly rated, highlighting their potential contribution to smoother business activities. Meanwhile, reducing errors in financial records received the lowest mean of 3.28, suggesting opportunities to improve recordkeeping practices. Overall, transaction efficiency, accessibility, financial security, and easier financial management were important considerations in supporting operational cost reduction among small businesses.

Concerning the level of operational cost reduction, the following statements were gathered from the small business owners during the interviews:

- **SB1:** Highlights faster processing of supplier payments and utility bills as an operational benefit of digital payment systems.
- **SB2:** Emphasizes reduced transportation expenses and travel time when receiving payments from distant customers, noting that these savings outweigh additional internet costs.
- **SB3:** Highlights reduced time and effort compared with traveling to remittance centers, while recognizing the role of security features in protecting transactions.
- **SB4:** Emphasizes time and effort saved in deliveries and supplier payments by eliminating the need to prepare, carry, count, and provide change. The respondent also notes that some online payments have no additional charges.
- **SB5:** Highlights how digital payments simplify daily operations by reducing the need to prepare change and offering flexible payment options for both the business and its customers.

Insights from small business owners highlighted the operational benefits of digital payment adoption in compressing transaction durations, optimizing transportation expenses, and minimizing manual cash-handling tasks. Specifically, SB1 and SB4 emphasized faster supplier payment loops, localized utility billing cycles, and streamlined delivery setups, while SB2 and SB3 noted a clear contraction in spatial travel times and transport expenditures. Furthermore, SB5 underscored how flexible payment mechanisms simplify daily merchant routines by mitigating manual change preparation demands. These qualitative findings align with the operational efficiencies discussed in [1], suggesting that digital payment systems may help streamline transaction processing and reduce daily operational burdens among small businesses in rural communities.

The Relationship between the Profile of the Respondents and the Extent of Digital Payment Adoption can be seen in Table 7.

Table 7. Relationship between the profile of the respondents and the extent of digital payment adoption (chi-square test of independence).

Variable	<i>p</i> -value	Relationship
Age	0.053	Not Significant
Sex	0.060	Not Significant
Educational Attainment	0.077	Not Significant
Monthly Business Revenue	0.133	Not Significant
Years of Business Operation	0.758	Not Significant

The findings revealed that age, sex, educational attainment, monthly business revenue, and years of business operation had no statistically significant relationship with digital payment adoption. This indicated that respondents with different demographic and business profiles demonstrated similar levels of adoption. The results suggested that practical factors, such as convenience, security, accessibility, and perceived usefulness, may be more relevant to adoption than personal or business characteristics. This consistency matches the practical and technological adoption factors highlighted in [2], emphasizing the relevance of these factors in understanding digital payment adoption among small businesses.

The Relationship between the Profile of the Respondents and the Level of Operational Cost Reduction in Small Businesses can be seen in [Table 8](#).

Table 8. Relationship between the profile of the respondents and the level of operational cost reduction (chi-square test of independence).

Variable	<i>p</i> -value	Relationship
Age	<.001	Highly Significant
Sex	0.760	Not Significant
Educational Attainment	<.001	Highly Significant
Monthly Business Revenue	<.001	Highly Significant
Years of Business Operation	0.531	Not Significant

The findings revealed that age, educational attainment, and monthly business revenue had statistically significant relationships with operational cost reduction, while sex and years of business operation showed no significant relationships. This indicated that respondents' experiences of operational cost reduction through digital payment systems varied according to selected demographic and socioeconomic characteristics. Overall, age, educational attainment, and monthly business revenue may be more relevant in understanding differences in perceived operational cost reduction among small businesses.

The Relationship between the Extent of Digital Payment Adoption and the Level of Operational Cost Reduction in Small Businesses can be seen in [Table 9](#).

Table 9. Relationship between the extent of digital payment adoption and the level of operational cost reduction (Spearman's rank-order correlation).

Variable	Spearman's ρ	<i>p</i> -value	Relationship
Security	0.228	0.012	Significant
Convenience	0.246	0.007	Significant
Accessibility	0.233	0.011	Significant
User Acceptance	0.328	<.001	Highly Significant

The findings indicated that security, convenience, accessibility, and user acceptance were positively and significantly related to operational cost reduction among small businesses. User acceptance showed the strongest relationship, followed by convenience, accessibility, and security. These findings emphasized the importance of secure transactions in protecting business activities, convenient payment processes in saving time and effort, accessible platforms in reducing travel requirements, and user acceptance in encouraging continued digital payment use. Overall, the four dimensions of digital payment adoption were positively associated with perceived operational cost reduction among the participating small businesses.

4 Conclusion

Based on the analysis and interpretation of the findings, the study arrived at the following conclusions:

1. The study found significant relationships between age, educational attainment, and monthly business revenue and the level of operational cost reduction. In contrast, sex and years of business operation showed no significant relationship. This indicated that respondents' perceptions of operational cost reduction through digital payment systems varied according to selected demographic and socioeconomic characteristics.
2. The study found no significant relationship between the respondents' profiles and the extent of digital payment adoption. Age, sex, educational attainment, monthly business revenue, and years of business operation showed no significant association, indicating that digital payment adoption was relatively consistent among small businesses with different demographic and business characteristics.
3. The study found positive and significant relationships between digital payment adoption in terms of security, convenience, accessibility, and user acceptance and operational cost reduction. User acceptance showed the strongest relationship, followed by convenience, accessibility, and security. These findings highlighted the importance of secure transactions, convenient payment processes, accessible platforms, and willingness to use digital payments in supporting operational cost reduction among small businesses.

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