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Exploring the Barriers of Non-Full Adoption of Cashless Payments among Retail Stores in Digos City: An Exploratory Factor Analysis

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ABSTRACT

The rise in digital transactions has promoted the use of cashless payment systems. However, many retail outlets have not yet fully adopted, due to a variety of operational and institutional issues. This study was designed to identify the obstacles faced by retail stores in the non-full adoption of cashless payments and to formulate a factor structure to account for these obstacles in Digos City, Davao del Sur. The researcher used Exploratory Factor Analysis (EFA) to identify the dimensions that affect non-full adoption. A structured survey questionnaire was used to gather data from 258 retail owners/managers, and the data were analyzed using maximum-likelihood extraction (varimax rotation). Although six factors initially had eigenvalues greater than 1, a three-factor solution was retained after factor refinement based on the interpretability and coherence of the resulting factors. The findings revealed three significant factors affecting non-full adoption: Cost-Related and Operational Limitations, Banking and Government Support Limitations, and Lack of Training and Customer Preference. Among these, Cost-Related and Operational Limitations were the most influential factors, underscoring the impact of transaction fees, infrastructure costs, and system maintenance. There are also fewer financial institutions and government support, customer preferences, and inadequate staff training in the use of cashless payment methods that contribute to the partial adoption of cashless payment modes. The study concludes that despite the growing presence of cashless technologies, several barriers continue to hinder their full implementation in retail settings.

INTRODUCTION

As technology advances at an unprecedented pace, integrating digital payment systems has become crucial for retail businesses seeking to meet growing consumer expectations and remain competitive in an increasingly digital world (Brown *et al.*, 2024). However, most merchants, micro, small, and medium enterprises (MSMEs), decline to use cashless payments (Jacob, 2024). Digitalization has substantially influenced consumer habits, resulting in a growing preference for faster, more convenient payment methods (Yang *et al.*, 2021). Thus, previous studies suggest that businesses should adopt an open innovation perspective, as it plays an essential role in accelerating and amplifying their business performance (Rahman *et al.*, 2022).

This research is anchored in the Diffusion of Innovation (DOI) Theory, along with comparative advantage, complexity, and sustainability, which influence the extent to which it is adopted by groups and organizations (Chen, 2024). To explain why different firms are disproportionately willing to adopt cashless payments, DOI argues that the pace of adoption depends not only on the technology itself but also on adopters' attitudes and the influence of early users (Ramayah *et al.*, 2025). In support of this, Anico (2024) highlights that barriers, including transaction costs, security concerns, and lack of awareness, remain major problems for small firms considering cashless systems. The framework highlights

how social systems drive adoption, with peer influence and interactions having the power to control whether innovations spread or are prevented (Ramayah *et al.*, 2025). Thus, using the DOI Theory in this study helps determine the barriers to the adoption of cashless payments in retail stores in Digos City.

This study was significant because it provided valuable insights into the barriers to the full adoption of cashless transactions in retail stores in Digos City. The findings of this study contributed to the development of strategies that support retail businesses in adopting cashless payment systems and enhancing customer service. The study also enriched academic knowledge and served as a valuable reference for future research on financial integration and digital innovation. Furthermore, the results may assist policymakers, business owners, and financial institutions in designing policies, strategies, and programs that promote the broader adoption and effective implementation of cashless payment systems among retail businesses.

Research Objectives

1. To generate a pool of items representing potential barriers to cashless payment in retail stores in Digos City.
2. To determine the underlying factor structure of barriers influencing cashless payment adoption in retail stores in Digos City.

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LITERATURE REVIEW

Studies conducted worldwide have shown that businesses face both structural and behavioral barriers when adopting a cashless payment system. In Sweden, Dimitrova *et al.* (2021) noted that credibility and normative practices remain major barriers for small enterprises adopting digital payments. Similarly, research in Indonesia by Widayani *et al.* (2022) emphasized that issues such as unstable internet connections and lack of access to digital devices discourage the sustainability of such transactions. More broadly, across Bengaluru's eight zones in India, Raj *et al.* (2023) stated that the benefits of a cashless economy can be achieved only if many people regularly use cashless methods.

In the Philippines, digital payment platforms are steadily gaining public acceptance, with the use of PESONet and InstaPay showing rapid growth during the pandemic (Glindro, Ofiaza, & Jose, 2024). Building on this progress, Park *et al.* (2022) found that perceived usefulness, perceived ease of use, perceived trust, and technology awareness influenced behavioral intention toward contactless payments in the Philippines. These findings highlight the importance of technological capability, ease of use, and trust in encouraging the adoption of cashless payment methods. Similarly, Tan and Quintilla (2025) found that efficiency, security, and reliability influenced satisfaction with digital financial services in Metro Manila. These findings suggest that security, reliability, and technological factors may influence the continued use of digital payment services. Despite the increasing acceptance of digital payments and the efforts to promote their use, some retail stores may continue to rely on cash due to barriers related to technology, security, reliability, and customer preferences. These factors warrant further exploration among retail stores in Digos City.

Digital payments have seen rapid growth in recent years, driven by technological advancements, enhanced internet insight, and the widespread adoption of smartphones, which encourage local communities to embrace cashless transactions (Gesta *et al.*, 2025). Digos City has been recognized as a finalist for the Philippine Chamber of Commerce and Industry's "Most Business-friendly LGU" award, underscoring its growing drive in commerce. Despite the growing presence of digital platforms nationwide, many retail store owners still rely on cash transactions because of perceived barriers.

MATERIALS AND METHODS

Respondents

The study's respondents were owners, managers, or authorized representatives of retail stores currently operating in Digos City. They were directly involved in the day-to-day management of their stores, dealing with consumers and making critical decisions to run them effectively. The study was conducted on small to medium-sized retail outlets that are often open to the public, including 7/11 and convenience stores, as well as

grocery stores. To be a part of the research, regardless of gender or level of education, participants must be at least 18 years old and have managed or run a retail business for at least a year. Retail businesses that had not yet implemented cashless transaction systems (100% cash or partially cashless) were also included in the study. Exclusions applied to under 18, not directly involved in store operations, and those with less than one year of retail management experience. Also, stores that had not implemented cashless payment features were excluded from the study.

A total of ten (10) respondents were purposively selected for an in-depth interview (IDI) to obtain richer and more detailed information about their financial practices, challenges, and decision-making process. A sample of ten (10) participants was considered appropriate for the in-depth interviews, as recent qualitative research literature indicates that six to ten participants may suffice for generating rich qualitative data (Dahal *et al.*, 2024). This enables the researchers to collect data, develop an understanding from the study sample, and achieve data saturation. According to Exploratory Factor Analysis (EFA), the minimum acceptable sample size is 100-250 respondents (Sabo *et al.*, 2024). A total of 258 respondents were selected through a simple random sampling technique to ensure the fairness and unbiased representation in the larger data collection process. This sample size was considered adequate to produce reliable data and to help identify the factors influencing barriers to cashless payment adoption among retail stores in Digos City. All respondents were clearly informed that they were participating in this study as volunteers and that they could withdraw at any time without consequences.

Instruments

The study used a survey questionnaire developed through an iterative process that combined researcher-designed questions with qualitative items derived from preliminary discussions with retail owners. To gain richer insights and support the survey data, qualitative research used pre-tested questions and in-depth interviews (IDIs). After, the next process was EFA with Varimax rotation, which was carried out to validate the instrument's structure. The results showed that three factors with eigenvalues > 1 accounted for 35.4% of the total variance, indicating instrument complexity.

Moreover, the findings from the qualitative interviews were used to triangulate and strengthen the quantitative results, allowing the researchers to gain a more comprehensive understanding of the respondents' perspectives and experiences. This mixed-method approach enhanced the credibility of the study by combining statistical analysis with detailed contextual insights. Furthermore, the integration of both quantitative and qualitative findings provided a stronger basis for interpreting the results and developing more accurate conclusions and recommendations.

Table 1: Interpretation of the 5-Point Likert Scale on the Barriers of Non-Full Adoption of Cashless Payments Among Retail Stores

Range of Mean	Numerical Scale	Descriptive Level	Descriptive Interpretation
5	4.20-5.00	Strongly Agree	This indicate that the barriers to the non-full adoption of cashless payments among retail stores are always observed.
4	3.40-4.19	Agree	This indicate that the barriers to the non-full adoption of cashless payments among retail stores are often observed.
3	2.60-3.39	Neutral	This indicate that the barriers to the non-full adoption of cashless payments among retail stores are sometimes observed.
2	1.80-2.59	Disagree	This indicate that the barriers to non-full adoption of cashless payments among retail stores are rarely observed.
1	1.00-1.79	Strongly Disagree	This indicate that the barriers to the non-full adoption of cashless payments among retail stores are not observed at all.

Design and Procedures

The study explored the barriers to cashless adoption among retail operators in a schematic model. The model was classified and labeled as Factors 1 to 3, representing the fundamental attributes of the underlying constructs. The prime variable was barriers to cashless adoption, positioned at the center of the model, with these proposed determinants surrounding it.

The model, illustrated in Figure 1, shows the barriers affecting cashless adoption in the study area. The study employed a quantitative design and Exploratory Factor

Analysis (EFA) as the primary statistical method to validate the questionnaire items. EFA is a system used to examine construct validity by grouping related items into logical factors (Ahmad *et al.*, 2024). To narrow down and test the questionnaire, the research began with a qualitative component comprising pretested questions and in-depth interviews (IDIs) with retail owners. This method assured that the underlying components and factors were determined from initial data and that the questionnaire was properly structured before proceeding to the quantitative stage.

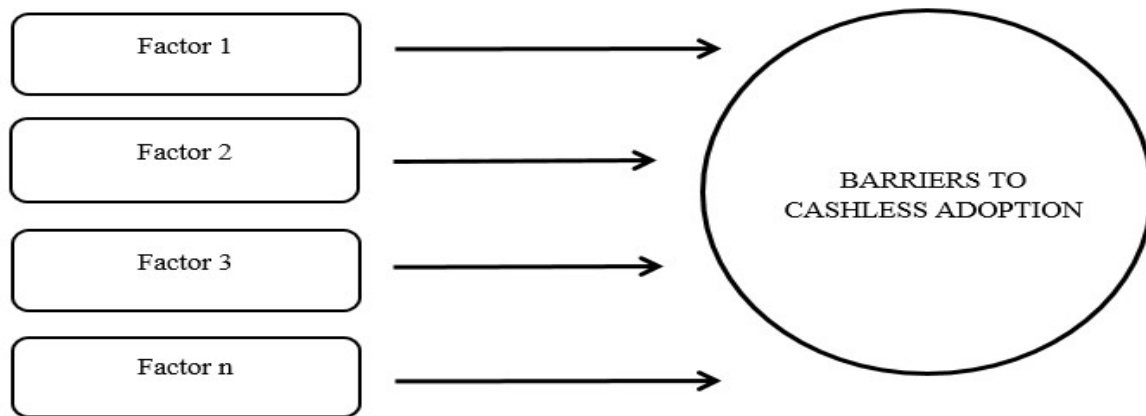


Figure 1: Diagram showing the indicators of cashless adoption

After gathering qualitative responses, the researchers used EFA to identify groups of related items in the data. The questionnaire was pilot tested to ensure the instrument's reliability and validity before distribution to the target respondents. Two preliminary tests were conducted. The Kaiser-Meyer-Olkin (KMO) test was also used to further evaluate sampling adequacy, whether the data were valid for factor analysis by calculating the total percentage of variance shown, and Bartlett's Test of Sphericity was performed to evaluate whether the correlation matrix significantly differed from an identity matrix. Furthermore, the data were analyzed using a 5-point Likert scale, focusing on the barriers to cashless adoption among retail owners of Digos City.

The data-gathering process was carried out through the personal administration of survey questionnaires to participants, accompanied by a consent letter. Prior to collecting data, permission was obtained from the Research and Innovation Center (RIC). The collected data were then analyzed using various statistical methods, including frequency analysis to present demographic profiles and mean scores to identify the most common responses related to financial struggles. The researchers assessed the findings in relation to the theoretical framework and research discrepancies, presenting the overall interpretation of the factors involved. Various statistical techniques were applied to ensure accurate data analysis during the Exploratory Factor Analysis

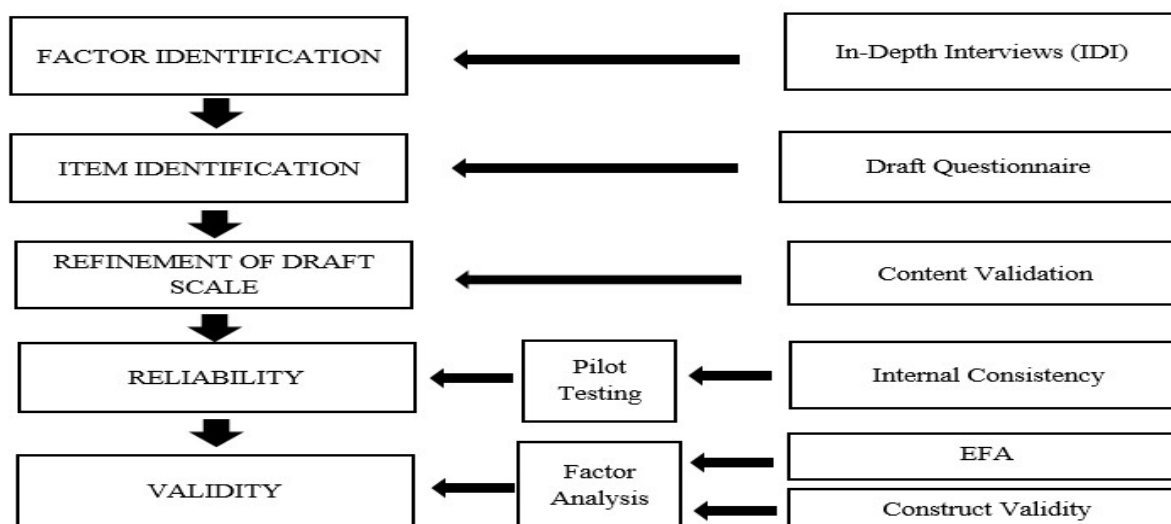


Figure 2: Scale Development Process of Cashless Adoption (Navarro & Murcia 2022)

(EFA). Furthermore, these statistical procedures enabled the researchers to systematically examine the data and generate findings that accurately reflected participants' experiences.

Data reduction simplifies complex data by identifying and extracting key factors (Nwokoma *et al.*, 2024). One of the most common applications of this is Exploratory Factor Analysis (EFA), which helps cluster correlated variables into meaningful constructs without compromising data integrity (Howard *et al.*, 2023). Prior to factor extraction, sampling adequacy is assessed using the Kaiser-Meyer-Olkin (KMO) statistic (Thao *et al.*, 2022), while Bartlett's test of sphericity is applied to confirm that correlations among variables are sufficiently large for factor analysis (Kartika *et al.*, 2023). The number of factors retained is determined by considering multiple criteria, including the Kaiser criterion of eigenvalues greater than 1.0 and examination of the scree plot (Reijer *et al.*, 2024). For ease of interpretation, orthogonal rotation techniques such as varimax are used, as they clarify factor structures and minimize cross-loadings among variables (Ahmed & Maruod, 2025). Furthermore, a threshold of 0.60 is used to ensure that the items retained are meaningful for the constructs they represent (Kishore *et al.*, 2022).

Ethical Considerations

For ethical considerations in the study titled "Exploring the Barriers to Non-Full Adoption of Cashless Payments Among Retail Stores in Rigos City: An Exploratory Factor Analysis" The researcher adhered to full ethical standards in administering the research, underwent examination and approval by the UM Digos Research and Innovation Center, and followed the study protocol, assessments, and standardized criteria, particularly in managing the population and data.

Voluntary Participation

Voluntary participation was emphasized, and all respondents were able to participate freely without fear

of repercussions. The researchers thoroughly explained the objectives of the study to the respondents. They assured them that their right to participate or withdraw at any time would be fully respected, without penalty.

Privacy and Confidentiality

Privacy and confidentiality were maintained throughout the study. Any personal and business-related information shared by the respondents was secured and handled with the utmost confidentiality. All gathered data were used for academic purposes and were not disclosed beyond the research process or to unauthorized persons.

Informed Consent Process

The researchers ensured that the participants clearly understood the study's purpose and scope and that no survey questionnaires or interviews were conducted without their consent. The study involved retail store owners, managers, and authorized representatives in Digos City; they were informed of their role as respondents before participating.

Benefits

While the study may not have directly benefited the respondents, its findings contributed to increased awareness and to strategies for adopting cashless transactions in retail stores. The results may help retail businesses better understand the challenges associated with adopting cashless payments.

Plagiarism

Plagiarism was avoided by appropriately citing all sources and using editing platforms to ensure original expression. Proper acknowledgment was given to all referenced materials used.

Fabrication

The researchers did not engage in fabrication by avoiding the presentation of false or inaccurate data, appropriately

acknowledging prior work, and maintaining honesty and integrity throughout the research process.

Conflict of Interest

The researchers have disclosed any potential conflicts of interest or personal factors that could have affected the study's outcome to ensure transparency and fairness. The researchers remained objective in the collection, analysis, and interpretation to maintain the integrity and credibility of the study's findings.

Deceit

The researcher also assured that no form of misrepresentation appeared in data collection, ensuring transparency and ethical treatment of participants. Prior to conducting the study, formal authorization was secured from relevant organizations and locations.

Permission from Organization/Location

The researcher revised the manuscript with the adviser, but only with the adviser's consent, and the researcher and the adviser co-authored all presentations and publications.

RESULTS AND DISCUSSION

Significant Statements and Equivalent Created Items

Based on the preliminary findings, Table 2 presents the initial list of items as potential barriers to the adoption of cashless payment by retail stores in Digos City. A 19-item questionnaire was developed to ensure that the items were clear, relevant, and sufficiently comprehensive to reflect the potential challenges faced by retail businesses implementing cashless payment systems. The findings revealed several barriers that may affect the full adoption of cashless transactions, including operational, financial, technological, and customer-related concerns experienced by retail stores.

Table 2: Significant Statements and Equivalent Created Items

Items	Significant Statements
1	Our store experience occasional system errors during cashless payment transactions. (Ang among tindahan makasinati ug system errors sa panahon sa cashless payment transactions.)
2	Our store feel that waiting for payment confirmation slows down completing transactions. (Ang among tindahan naka-bati nga ang paghulat sa kumpirmasyon sa bayad makapahinay sa pagkompleto sa mga transaksyon.)
3	During maintenance or downtime, the store is unable to process cashless transactions. (Panahon sa maintenance o downtime, makaproseso ang among tindahan og cashless nga mga transaksyon.)
4	Our store can't financially manage the adoption of cashless payment systems. (Dili kaya sa among tindahan financially ang pag-adopt sa cashless payment systems.)
5	Our store does not see transaction fees as normal part of running of business. (Sa among tindahan, dili namo giisip nga normal ang transaction fees sa pagpadagan sa negosyo.)
6	Our cashless payment options are limited because we do not have machines like POS terminals for card payments. (Ang among cashless payment options limitado kay wala mi makina sama sa POS terminals para sa card payments.)
7	Our store experience difficulties in cashless transactions when the internet connection is poor. (Makasinati among tindahan ug kalisod sa cashless transaction kung hinay ang internet connection.)
8	Our store worry that some customers might give false information when paying cashless. (Among tindahan nabalaka nga basin naay mga kostumer nga maghatag ug sayop o peke nga impormasyon kung magbayad ug cashless.)
9	Our store does not fully use cashless transactions due to fear of fraudulent. (Ang among tindahan dili pa kaayo fully naggamit ug cashless nga transaksyon tungod sa kahadlok sa fraud o panikas.)
10	Cashless payment transactions become difficult when assigned staff lack adequate training or knowledge. (maglisod ang cashless payment transactions kung ang staff nga gi-assign walay igo nga training o kahibalo.)
11	Cashless payment systems are not easy to learn and use without formal training. (Ang cashless payment system kay dili sayon makat-onan ug gamiton nga wala'y formal nga training.)
12	Some customers strongly prefer cash because they are not familiar with cashless payments. (Ang uban kostumer mas gusto gyud ang cash kay wala pa sila kahibalo sa cashless payments.)
13	Limited understanding of cashless transactions makes hard for our store to fully go cashless. (Ang limitado nga pagsabot sa cashless transactions naglisod sa among tindahan nga mahimong fully cashless.)
14	Our store cannot fully shift to cashless payments because customer preferences must be considered. (Among tindahan dili pa ka fully shift sa cashless payments kay kinahanglan i-consider ang customer preferences.)
15	Customers who are less familiar with technology often prefer cash payments. (Ang mga kostumer nga dili pamilyar sa technology kasagaran gusto ang cash payments)
16	Our store needs to balance cash and cashless options to meet different customer needs. (Kinahanglan sa among tindahan nga i-balance ang cash ug cashless options para matubag ang lain-lain needs sa kostumer.)

17	Our store notice that frequent changes or unclear policies can delay cashless payment adoption. (Makabantay ang among tindahan nga ang kanunay nga pag usab o dili klaro na policies makadelay sa adoption sa cashless payments.)
18	Our store experience limited support from some banks in e-wallets which restricts wider use of cashless payments. (Ang among tindahan nakasinati ug limitado nga suporta gikan sa ubang bangko sa e-wallets, nga nag-limit sa mas lapad nga paggamit sa cashless payments.)
19	Our store notice that government support, such as stable internet and clear policies, is still insufficient for full adoption. (Makabantay ang among tindahan ang suporta sa gobyerno, kulang pa para sa full adoption.)

Factors Exploring the Barriers of Non-Full Adoption of Cashless Payments Among Retail Stores

To identify the primary dimensions within the 19-item dataset related to barriers to the non-full adoption of cashless payments, a data reduction analysis was performed to determine the underlying factors among retail stores in Digos City. Factors with eigenvalues greater than 1.0 are retained, as these are considered significant in explaining the underlying structure of the data, and factors that do not exceed this threshold are excluded (Adolfo & Sinang, 2024). Furthermore, varimax

rotation was applied to the factor-loading matrix to obtain an orthogonal solution that enhances interpretability by maximizing simple structure (Ahmed & Maruod, 2025). Using varimax rotation, three dimensions were retained. The maximum likelihood extraction method was first employed to estimate factor loadings that best fit the observed data, after which varimax rotation was applied to produce a simpler and more interpretable factor structure where variables load strongly on a single factor, thereby improving clarity and reliability of the results (Vogelsmeier *et al.*, 2024).

Table 3: KMO and Bartlett's Test Sphericity

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.		0.728
Bartlett's Test of Sphericity	Chi-Square	207
	Df	78
	P value	<.001

The Kaiser-Meyer-Olkin (KMO) measure is used to assess how suitable the data are for factor analysis. In simple terms, it determines whether the data incorporates adequately strong underlying relationships to form reliable factors (Sigudla & Martiz, 2023). The KMO test results yielded a value of .728, which exceeds the recommended minimum threshold of 0.60, indicating that the correlations among variables are sufficiently strong to proceed with factor analysis (Staffini *et al.*, 2022). Additionally, values closer to 1 indicate greater sampling adequacy, meaning that the variables are more likely to yield reliable and distinct factor structures (Thao *et al.*, 2022).

Bartlett's Test of Sphericity yielded a statistically significant result (Chi-Square = 207.000; <0.001), showing that the correlation matrix is not an identity matrix and that the variables are adequately related for factor analysis (Sigudla & Martiz, 2023). The very low p-value indicates that the

null hypothesis of no correlations among variables can be rejected, suggesting that the relationships observed are meaningful and not due to chance (Sürücü *et al.*, 2022). Hence, the findings support proceeding with factor extraction and further interpretation in the study.

After confirming that the identified dimensions are appropriate for analysis, the next step is to assess the adequacy of the developed factors based on the study's criteria. Based on the eigenvalue greater than 1.0, six (6) dimensions were found suitable for extraction both prior to and after varimax rotation, accounting for a cumulative variance of 60.837% (see Table 2).

Following the analysis, the scree plot was used to assess the extracted factors visually. The curve shows a steady decline up to the sixth factor, suggesting that the later factors explain progressively less variance, with minimal contribution beyond this point.

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	1.763	13.563	13.563	1.763	13.56	13.6	1.71
2	1.528	11.751	25.315	1.528	11.75	25.3	1.52
3	1.307	10.056	35.371	1.307	10.06	35.4	1.24
4	1.192	9.17	44.541	1.192	9.17	44.5	1.24
5	1.109	8.528	53.069	1.109	8.528	53.1	1.17
6	1.01	7.768	60.837	1.01	7.768	60.8	1.08

7	0.953	7.329	68.166				
8	0.892	6.863	75.029				
9	0.785	6.037	81.066				
10	0.722	5.553	86.619				
11	0.643	4.943	91.561				
12	0.573	4.407	95.968				
13	0.524	4.032	100				

As stated by the study of Lelis *et al.* (2023), factors consisting of fewer than three (3) items may be considered inadequate for inclusion because they do not sufficiently define or represent the underlying construct. In line with this criterion, a total of three (3) factors were retained, as these sufficiently capture the underlying structure of the data and yield a more stable and reliable factor solution (Goretzko, 2022).

Based on the result of the study, a total of six items

were excluded because of their insufficient validity (item extraction values less than 0.40), a total of 3 dimensions were generated with three (3) items each, based on the data from the data set. Discussion of each generated factor is as follows: factor 1 consists of three (3) items (item_4, item_5, and item_3) with a factor loading ranging from 0.602 to 0.753. In addition, this dimension has an eigenvalue of 1.76, a total variance explained of 13.56%, and a cumulative variance explained of 13.6%.

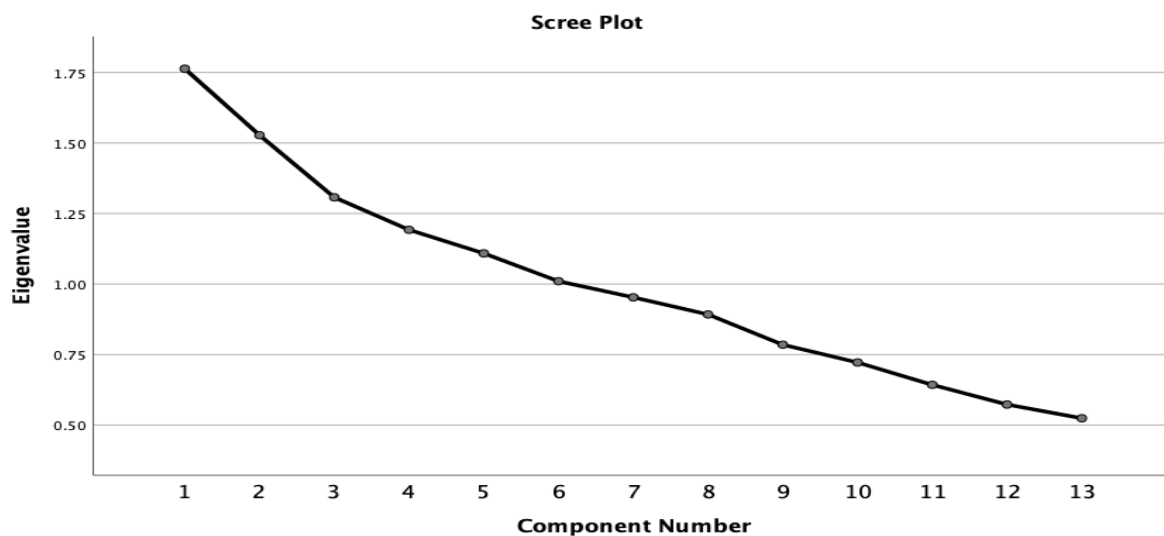


Figure 3: Scree Plot of the extracted factors

Factor 2 has three (3) items (item_18, item_17, and item_19) with a factor loading ranging from 0.579 to 0.781. In addition, this dimension has an eigenvalue of 1.52, a total variance explained of 11.75%, and a cumulative total of 25.3%.

Finally, factor 3 has three (3) items (item_11, item_10, and item_12) with a factor loading ranging from .593 to .701. In addition, this dimension has an eigenvalue of 1.31, a variance explained of 10.06%, and a cumulative percentage of 35.4%.

Table 5: Factors Non-Full Adoption of Cashless Payments

Items	Statements	1	2	3	4	5	6
4	Our store can't financially manage the adoption of cashless payment systems.	0.753					
5	Our store does not see transaction fees as a normal part of running the business.	0.744					
3	During maintenance or downtime, the store is unable to process cashless transactions.	0.602					
18	Our store experience limited support from some banks in e-wallets which restricts wider use of cashless payments.		0.781				
17	Our store notice that frequent changes or unclear policies can delay cashless payment adoption.		0.627				

19	Our store notice that government support, such as stable internet and clear policies, is still insufficient for full adoption.		0.579				
11	Cashless payment systems are not easy to learn and use without formal training.			0.701			
10	Cashless payment transactions become difficult when assigned staff lack adequate training or knowledge.			0.600			
12	Some customers strongly prefer cash because they are not familiar with cashless payments.			0.593			
9	Our store does not fully use cashless transactions due to fear of fraudulent.				0.76		
15	Customers who are less familiar with technology often prefer cash payments.				0.69		
14	Our store cannot fully shift to cashless payments because customer preferences must be considered.					0.85	
8	Our store worry that some customers might give false information when paying cashless.						0.843
	Eigenvalue	1.76	1.52	1.31	1.19	1.11	1.01
	% of Variance	13.56	11.75	10.06	9.17	8.53	7.77
	Cumulative %	13.56	25.34	35.37	44.54	53.07	60.84

Factor 1, labeled Cost-Related and Operational Limitations, accounts for 13.56% of the total variance, making it the most influential factor in the non- full adoption of cashless payment. High factor loadings of items in this component indicate difficulties with transaction fees, the cost of acquiring and maintaining payment technologies, and difficulties during transactions. The financial and operational challenges are evident in these issues and clearly limit retailers' ability to replace cash with cashless payments fully. High investment

costs and limited financial resources are among the obstacles small and medium enterprises face in adopting digital technologies. which prevent them from adopting new technologies (Widayani *et al.*, 2022). Moreover, insufficient financial capacity and lack of technological readiness contribute to operational difficulties in digital transformation (Restrepo-Morales *et al.*, 2024). Similarly, transaction costs and system-related expenses remain key concerns influencing merchants' decisions to adopt digital payment systems (Islam & Mario, 2025).

Table 6: Rotated Component Matrix with Grouped Attributes of Cost-Related and Operational Limitations

Dimension	Attributes	Loadings
	Item 4: Our store can't financially manage the adoption of cashless payment systems.	.753
Cost-Related and Operational Limitations	Item 5: our store does not see transaction fees as a normal part of running the business.	.744
	Item 3: During maintenance or downtime, the store is unable to process cashless transactions.	.602

Factor 2, termed Banking and Government Support Limitations, accounts for 11.75% of the variance and encompasses attributes related to institutional and regulatory challenges that affect the adoption of cashless payment systems. The adoption of cashless payment systems is influenced by the level of support from banking institutions and relevant government bodies, especially in developing countries where infrastructure is still evolving. Lack of integration and support from banking institutions

may affect the interoperability of e-wallet systems, hence affecting cashless transactions (Shetu *et al.*, 2022; Amnas *et al.*, 2023). Moreover, the limited availability of banking services, inconsistent implementation of government programs, and inadequate technological infrastructure may reduce retail store owners' confidence in fully adopting cashless payment systems, particularly among small businesses that rely heavily on stable financial and technical support for daily operations.

Table 7: Rotated Component Matrix with Grouped Attributes of Banking and Government Support Limitations

Dimension	Attributes	Loadings
	Item 18: Our store experience limited support from some banks in e-wallets which restricts wider use of cashless payments.	.781

Banking and Government Support Limitations	Item 17: our store notice that frequent changes or unclear policies can delay cashless payment adoption.	.627
	Item 19: Our store notice that government support, such as stable internet and clear policies, is still insufficient for full adoption.	.579

Additionally, the lack of consistent policies and the ambiguity of the rules can affect trust among the population and the adoption of cashless payment systems, as consistency and the establishment of rules are important for the long-term acceptance of the system (Ruslim *et al.*, 2024).

Factor 3, identified as Lack of Training and Customer Preference, contributes 10.06% of the variance and highlights barriers related to employee capability and customer behavior in adopting cashless payment systems. Insufficient technological and financial literacy significantly hinders the adoption of cashless payment systems, as users lacking the necessary knowledge are less

likely to use such technologies (Al-Qudah *et al.*, 2023). Consumer resistance to cashless payments is often linked to habit and a lack of familiarity, with many individuals continuing to prefer cash for its perceived simplicity and comfort. In addition, perceived ease of use and familiarity significantly affect user acceptance, especially when individuals have limited prior experience with cashless systems (Islam *et al.*, 2024). Furthermore, the absence of proper training and customer education may reduce confidence in using digital payment platforms, thereby slowing the transition toward cashless transactions among retail consumers and businesses.

Table 8: Rotated Component Matrix with Grouped Attributes of Lack of Training and Customer Preference

Dimension	Attributes	Loadings
	Item 11: Cashless payment systems are not easy to learn and use without formal training.	.701
Lack of Training and Customer Preference	Item 10: Cashless payment transactions become difficult when assigned staff lack adequate training or knowledge.	.600
	Item 12: Some customers strongly prefer cash because they are not familiar with cashless payments.	.593

In addition, the results of recent studies supported the identified factors influencing barriers to cashless payment adoption. The study by Khando *et al.* (2023) supported the finding that cost-related and operational limitations, including economic and technical challenges, hinder the implementation of digital payment systems. Low digital literacy, weak infrastructure, affordability concerns,

and limitations in banking systems collectively hinder the accessibility and adoption of cashless payment systems (Shahen and Sharaf, 2025; Ong and Chong, 2022). Collectively, these studies confirm that financial, institutional, and behavioral factors interact to hinder the full adoption of cashless payments, particularly in developing and emerging market contexts.

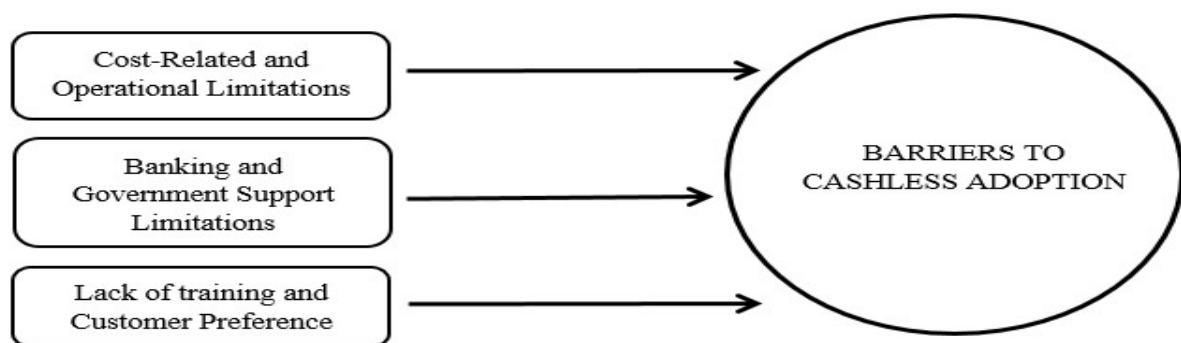


Figure 4: Factors of Non-Full Cashless Adoption

Recommendations

Based on the study's results, three factors that affect the non-full adoption of cashless payments among retail stores in Digos City were identified: Cost-Related and Operational Limitations, Banking and Government Support Limitations, and Lack of Training and Customer Preference. Interventions and programs can be developed to directly address these factors, thus making the system more widely adopted.

The training programs and financial support measures can be offered to assist retail store owners in dealing with the costs and operations of introducing a cashless system, where feasible, given cost and operational constraints. This can include educating retailers on cost-benefit analyses, offering incentives for implementing digital payment technologies, and providing technical assistance to minimize operational disruptions. Financial institutions and local government units may

collaborate more to address limitations in banking and government support. This can include working on interoperability, policy uniformity, and awareness to foster trust and confidence in cashless transactions.

Given a lack of training and customer preferences, capacity-building workshops and financial literacy programs can be developed to improve employees' skills and customers' understanding. Staff training on the effective use of the cashless system and information campaigns aimed at shifting customers' preferences toward digital payments could be effective.

One limitation of the study is the fact that only one city was selected. Future researchers might want to add other cities or regions to compare barriers across various settings. Longitudinal studies can also be carried out to assess the impact of the interventions over time, such as their effectiveness in increasing adoption rates and the digital readiness of retail businesses in general.

CONCLUSION

The study examines 258 retail owners and managers in Digos City, Davao del Sur, to gain a clearer understanding of the barriers they face in adopting cashless payment systems in their business operations. Three key factors were identified as significantly contributing to these challenges: Cost-Related and Operational Limitations, Banking and Government Support Limitations, and Lack of Training and Customer Preference. The factors were confirmed through the standard statistical process and were consistent and reliable in accounting for retail businesses' challenges in transitioning to digital payment methods. The results showed that cashless technology's high acquisition and maintenance costs, along with operational challenges such as systems integration and connectivity, are deterrents to implementation. Additionally, constraints on implementation due to limited support from financial institutions and government agencies, such as weak internet connectivity and limited financial assistance or benefits, hinder implementation. Meanwhile, the lack of training for business operators and the fact that many customers are still drawn to cash payments are still preventing more widespread use of cashless payment systems among retailers. The study concluded that there is a need to provide better institutional support, strengthen digital infrastructure, and improve financial and educational campaigns to promote the wider adoption of cashless payment systems in retail stores in Digos City.

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