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Cashless payment systems for business transactions: status, challenges, and viability among users

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Abstract: The study aimed to determine the status, challenges, and viability of cashless payment systems for business transactions among users. A survey correlational research design was used, data were collected from 140 participants across different user types in Iloilo, Philippines. Quota sampling ensured diverse representation. The survey included questions on participants' profiles, utilization, challenges, and viability of cashless payment systems. The findings reveal that majority were female, young adults, urban residents, with varied user type and income levels. GCash was the most used cashless payment method. There was high acceptance of cashless payments, particularly among older individuals, higher income brackets, privately employed and self-employed (freelancer) users. However, significant challenges included security concerns, technological barriers, consumer education, and regulatory issues. Females and older adults reported higher difficulties, especially regarding security and education. Despite these challenges, cashless payment systems demonstrated high viability due to their efficiency, financial transparency, and convenience. Additionally, users appreciated the environmental benefits and the widespread acceptance of cashless payments. The study concludes that while cashless payment systems was highly accepted and hold significant potential for enhancing business transactions, addressing the identified challenges is crucial for their broader adoption and viability. This research provides valuable insights for users, businesses owners, cashless payment companies, financial institutions, the government, and future studies on enhancing cashless payment system and user experience.

Keywords: Cashless payment systems, Business transactions, Digital transactions

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INTRODUCTION

Instructional materials play a vital role in order for the teaching and learning process to become more effective. As mentioned by Bukoye (2019), instructional materials are helping tools for teachers and enable learners to develop their macro-skills, including the use of Business transactions are basic economic activity that enable the exchange of goods and services between parties. These transactions involve trades such as sales, purchases, loans, and leases, all of which are essential for business operations and growth. Documenting and tracking these transactions guarantee openness, accountability, and adherence to legal and regulatory guidelines.

In the rapid evolution of technology, the nature of business transactions is changing. One of the most notable changes is towards cashless payment systems, a change evident globally and significantly impacting developing economies like the Philippines. The concept of a cashless society, where financial transactions are conducted electronically rather than using physical cash, has gained significant momentum globally. In countries like Sweden and China, the move towards cashless transactions is well-advanced, driven by widespread use of mobile payment platforms, supportive government policies and it offers numerous benefits, including increased convenience, reduced transaction times, improved security, and enhanced financial tracking.

However, the shift to a cashless society presents several challenges.

Cybersecurity threats are a major concern, as digital payment systems are vulnerable to hacking and fraud. Despite these challenges, the potential benefits of a cashless society are

substantial. For businesses, cashless transactions streamline operations, reduce the risk of theft, and provide valuable data for customer relationship management. For consumers, they offer convenience and safety. Furthermore, cashless payment systems can enhance financial inclusion by providing access to financial services for unbanked populations, fostering economic growth and reducing poverty. The viability of a cashless society depends on addressing security concerns, bridging the digital divide, and ensuring that digital payment systems are accessible and user-friendly for all segments of the population (Diniz et al., 2011; Ozili, 2018).

The Philippines, an archipelagic nation in Southeast Asia with a diverse economy and a population of over 117.3 million people according to the Philippine Statistics Authority (PSA) in 2023, has a long history of trade and business activities. The country's economic landscape varies across regions, each uniquely contributing to the national economy. According to the Commission on Audit's (COA) 2023 Annual Audit Report, Cebu is the wealthiest province, driven by industries such as manufacturing, tourism, and agriculture. Other significant economic centers include Rizal, Batangas, Davao del Norte, Cavite, Laguna, Negros Occidental, Pampanga, Bulacan, and Iloilo which recognized as the trade and commerce hub of Western Visayas. Iloilo's local economy is diverse, encompassing sectors like agriculture, tourism, and manufacturing. Notably, Iloilo, is increasingly embracing digital transactions. The adoption of cashless payment systems in the region is gradually rising, driven by government initiatives to promote financial inclusion and the growing penetration of smartphones and internet access.

Cashless transactions have gained popularity due to their convenience, speed, and security. This growth is supported by government efforts to promote financial inclusion and the widespread use of smartphones and internet access. The Bangko Sentral ng Pilipinas (BSP) has been actively working to increase digital payments through the National Retail Payment System (NRPS), aiming for 50% of all payments to be made digitally by 2023. This initiative seeks to establish a safe, efficient, and inclusive digital finance environment. Several cashless payment apps have emerged, catering to the diverse needs of consumers and businesses. Prominent examples include GCash.

PayMaya, Coins.ph. These platforms offer services such as money transfers, bill payments, online shopping, and investment opportunities. Their user-friendly interfaces and widespread acceptance have significantly contributed to the adoption of cashless payment systems.

The Department of Trade and Industry (DTI) reported on 2021 a substantial increase in online shopping and e-commerce, emphasizing the need for efficient payment systems. However, a survey by the National Privacy Commission (NPC) revealed that 74% of Filipinos in year 2020 are concerned about the security of their personal and financial data when using digital payment methods. The BSP plays a pivotal role in regulating and supervising payment systems. Key regulations include, BSP Circular No. 649 (2020): Governing digital payments to ensure integrity and security and Republic Act No. 11127 (National Payment Systems Act, 2018): Providing the legal framework for payment systems, emphasizing safety, efficiency, and accessibility.

Despite the growing popularity of cashless systems, cash remains dominant, with 99.2% of all transactions made in cash as of 2020 according to the Philippine Statistical Authority (PSA). The Banko Sentral ng Pilipinas (BSP) Financial Inclusion Survey (2019) found that only 29.2% of Filipino adults have formal bank accounts, leaving nearly 71% unbanked or underbanked. Common barriers include, lack of funds, lack of documentation, distrust in banks and distance from bank branches. This lack of formal banking access leads to challenges in saving money, accessing credit, and participating in the formal economy, along with increased vulnerability to financial scams and fraud.

The need for alternative payment options is clear. Mobile wallets, electronic money issuers, and peer-to-peer lending platforms can help reach unbanked and underbanked Filipinos, providing access to essential financial services. The rise of mobile money systems like GCash, PayMaya, and Coins.ph has significantly contributed to this shift, allowing numerous financial transactions via mobile phones.

With over 168.3 million mobile connections in early 2023, the Philippines has a large potential user base for mobile payment solutions. These solutions offer several advantages over traditional payment methods, such as increased convenience and speed, enhanced security through encryption and authentication and reduction of financial exclusion by enabling transactions without traditional banking services.

The adoption of cashless payment systems in the Philippines is at a pivotal juncture. The increasing ubiquity of mobile devices, growth in e-commerce, and the government's push for financial inclusion make this an opportune moment to assess the status, challenges, and viability of cashless payment systems for business transactions. Understanding the current landscape is essential for policymakers to ensure regulations foster innovation while safeguarding user interests, financial institutions and businesses to adapt to evolving payment preferences and remain competitive and consumers to benefit from a secure and convenient payment environment.

Considering the growing economy and the popularity of cashless payment systems, challenges and uncertainties regarding their widespread adoption and long- term viability remain. This study aims to fill the existing research gap by providing a comprehensive analysis of cashless payment systems for business transactions in terms of status, challenges, and viability among users.

Statement of the problem

This study aimed to determine the status, challenges, and viability of cashless payment systems for business transactions among the users.

Specifically, the study sought to:

1) Determine the profile of the participants in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

2) Determine the status of cashless payment systems for business transactions in terms of utilization, preference, acceptance, and awareness as assessed among users taken as a whole and grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

3.1) Determine the challenges of cashless payment systems for business transactions in terms of security concerns, technological barriers, consumer education and regulatory framework as assessed among users taken as a whole;

3.2) Determine the ranks of challenges as assessed among the users when taken as a whole;

3.3) Determine the degree of difficulty of the challenges as assessed among the users taken as a whole and grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

4.1) Determine the viability of cashless payment systems for business transactions in terms of enhanced efficiency, improved financial transparency, accessibility and convenience, and environmental benefits as assessed among users taken as a whole;

4.2) Determine the ranks of viability of cashless payment systems for business transactions as assessed among the users;

4.3) Determine the viability as assessed among the users taken as a whole and grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

5) Determine if significant differences would exist in the status of cashless payment systems for business transactions in terms of utilization, preference, acceptance and awareness as assessed among the users grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

6) Determine if significant differences would exist in the degree of difficulty of the challenges as assessed among the users grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used;

7) Determine if significant differences would exist in the viability as assessed among the users grouped in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used; and

8) Determine if significant relationships would exist among the users in terms of age, sex, monthly income, residence, user type, and most frequent cashless payment method used; status of, challenges of, and viability of cashless payment systems for business transactions as assessed among the users.

METHODOLOGY

Research design

The study utilized a survey-correlational research design to examine the status, challenges, and viability of cashless payment systems for business transactions among users. This design enabled the researcher to assess relationships between variables and gather comprehensive insights into user experiences with cashless payment systems. A structured questionnaire was the primary tool for data collection, ensuring a systematic approach to understanding key aspects such as utilization, preferences, and challenges.

Locale of the study and respondents

The study was conducted in Iloilo Province, a region in the Philippines that is rapidly embracing digital transactions. Participants included a diverse mix of individuals engaged in cashless payment systems, such as students, employed professionals, freelancers, business owners, and retired individuals. Quota sampling was used to ensure representation based on sex, age, income, and preferred payment methods.

Research instruments

A researcher-developed questionnaire served as the main data-gathering instrument. The questionnaire covered various domains, including participant demographics, status of cashless payment system usage, challenges faced, and perceptions of its viability. The tool was validated to ensure reliability and clarity in capturing data.

Data analyses procedure

The data were analyzed using descriptive and inferential statistical methods. Frequencies, means, and percentages were used for descriptive analysis, while inferential tools such as the Wilcoxon Rank-Sum Test and Kruskal-Wallis H Test assessed differences across groups. Pearson’s Chi-Square test identified associations between variables. The level of significance was set at 0.05, ensuring robust statistical inferences.

FINDINGS AND DISCUSSION

Participants’ profile

The findings revealed that majority of participants were female, comprising of 90 individuals (64.29%), while males accounted for 50 participants (35.71%) of 140 total participants.

Age distribution indicated that early adulthood was the most prevalent phase among participants, with 67 participants (47.86%), followed by young adults at 36 participants (25.71%). Middle adulthood and late adulthood categories constituted 24 (17.14%) and 13 (9.29%) participants, respectively.

In terms of monthly income, the largest group earned between Php10,000 to Php30,000, encompassing 52 participants (37.14%), followed by those with incomes less than Php10,000, comprising 40 participants (28.57%). Participants earning Php30,001 to Php70,000 represented 35 individuals (25.00%), while incomes above Php70,000 were reported by 13 participants (9.29%).

Regarding residence, urban residents comprised the majority, with 77 participants (55.00%), while rural residents accounted for 63 participants (45.00%). The sample was evenly distributed across various user categories, with each category comprising 20 participants (14.29%). These categories included students, privately employed, publicly employed, self-employed (freelancer), business owners, unemployed, and retired users.

On the most frequent cashless payment methods used, GCash emerged as the most frequently used, utilized by 63 participants (45.00%). Debit cards were the next most common at 39 participants (27.86%), followed by credit cards at 14 participants (10.00%). PayMaya, GrabPay, Coins.ph, and PayPal were less frequently used, each representing smaller proportions of the participants.

Status of cashless payment systems for business transactions

Status of cashless payment systems for business transactions in terms of utilization

The findings revealed that there is ‘Good’ (M = 4.06, SD = .70) level of utilization of cashless payment system among participants. Both male and female participants exhibited “Good” level of utilization of cashless payments, with slightly higher mean for males (M = 4.18, SD = .60) compared to females (M = 4.00, SD = .75).

Analysis by age groups showed that late adulthood individuals demonstrate the highest utilization level (M = 4.23, SD = .44), followed by middle adulthood (M = 4.17, SD

=.56), early adulthood (M = 4.12, SD = .77), and young adulthood (M = 3.83, SD = .70). This finding mirrors studies by Jones et al. (2019) and Tang et al. (2018), indicating older adults' growing acceptance of cashless payments due to their convenience and simplicity, thus suggesting age may not be a significant barrier to adoption.

Higher income brackets correlate with a more favorable utilization attitude towards cashless payments, with those earning above Php70,000 showing the highest mean score of 4.62 (SD = .51), consistent with Rahman et al. (2020), indicating that higher income individuals are more inclined towards mobile payment methods due to increased purchasing power and smartphone accessibility. Classified as to residence, both urban and rural residents showed ‘Good’ utilization levels of cashless payment system. However, privately employed individuals, self-employed (freelancer) individuals, and business owners exhibit higher utilization levels, aligning with Santos et al. (2021), indicating that financial autonomy and flexible work arrangements contribute to the adoption of mobile payment methods. The preferred cashless payment methods, including PayPal, credit cards, and Coins.ph, receive high ratings, denoting a ‘Very Good’ level of utilization, consistent with findings by Li et al. (2021), and Lee et al. (2019), highlighting their reliability, security features, and widespread acceptance among consumers.

Status of cashless payment systems for business transactions in terms of preference

The data revealed that there is a positive preference towards cashless payment systems among the participants, with an average mean score of 4.19 (SD =

.73), signifying a classification of 'Good'.

In terms of sex, female participants rated cashless payment systems as "Good" (M = 4.10, SD = .77), lower than the males' "Very Good" (M = 4.36, SD = .63), rating of the status of cashless payment system in terms of preference. The observation that male participants rated cashless payment systems higher than female participants mirrors the studies such as the one conducted by Smith (2018) in the United States.

Smith found that male consumers tend to exhibit a stronger tendency towards adopting mobile payment technologies compared to female. This indicates a potential sex difference in the preference for cashless payment systems, warranting further investigation and targeted interventions to address these differences.

Regarding age groups, there is a noticeable trend where older participants tend to express a more favorable preference towards cashless payment systems. Middle adulthood scored the highest mean which is described as "Very Good" (M = 4.50, SD = .51) and the young adult with the lowest mean described as "Good" (M = 4.15, SD = .71) This trend observed in the study, where older participants tend to rate cashless payment systems more positively, aligns with the findings of Jones, Smith, and Brown (2019) in the United Kingdom. Their study highlighted that older age groups are increasingly embracing mobile payment services, challenging the stereotype that digital payment adoption is primarily driven by younger generations. This underscores the importance of catering to the needs and preferences of diverse age demographics in promoting the use of cashless payment system for business transactions.

Monthly income also appears to influence preferences, as participants with higher incomes rated cashless payment systems more positively. Those with incomes above Php70,000 scored the highest mean of 4.62 (SD = .51), categorized as 'Very Good,' while those with income of less than Php10,000 scored the lowest mean of 3.95 (SD = .81), classified as 'Good.' Similar income-related trends were observed in the study of Chen and Wang (2020), highlighting the relationship between income level and the adoption of cashless payment systems.

In terms of residence, both urban and rural residents generally perceive cashless payment systems positively, with means of 4.18 (SD = .68) and 4.21 (SD = .79), respectively, falling within the categories of 'Good' and 'Very Good.' This contrasts with the findings of (Li & Zhang, 2017), which emphasized a stronger preference for cashless payments among urban residents due to better infrastructure and access to technology.

Regarding employment status, participants who are business owners or privately employed tend to rate cashless payment systems more favorably, with means ranging from 4.30 to 4.50, categorized as 'Very Good' This aligns with the results of Wong et al. (2021), which underscored the influence of occupation in shaping attitudes towards digital payment methods.

When considering the status of cashless payment method in terms of preference, those using Coins.ph, PayMaya, Credit Card, Debit Card and Paypal rated it 'Very Good' with means ranging from 4.21 to 4.50. This corresponds with the findings of Johnson and Lee (2018), highlighting the popularity of these payment platforms among users due to their convenience and security features.

Status of cashless payment systems for business transactions in terms of acceptance

The data revealed that both male and female participants expressed similar levels of acceptance, with females scoring a slightly lower mean of 4.06 (SD =

.61) compared to males with mean 4.14 (SD = .66), both within the 'Good' range. Similarly, participants across different age groups exhibited positive attitudes, ranging from 4.05 to 4.15. Monthly income levels also rated the acceptance of digital payment system as ‘Good’, with means spanning from 4.03 to 4.31 across income brackets.

Residence type showed minimal difference in means, as urban residents scored a mean of 4.06 (SD = .61) and rural residents a mean of 4.10 (SD = .68), displaying comparable acceptance levels. Additionally, various employment statuses, including students with a mean of 4.15 and business owners with a mean of 4.20, demonstrated favorable perceptions of cashless payments.

Analyzing preferred payment methods, PayMaya (SD = .65) received a mean score of 4.45 and Paypal a mean score of 4.25 (SD = .52), both classified as 'Very Good'. Other methods like GCash with a mean score of 4.02 (SD = .60) and debit cards with a mean score of 4.10 (SD = .66) were still perceived positively, falling within the 'Good' range.

These findings aligned to prior studies of Li and Wei's (2019) research in China highlighted the propensity of younger, affluent individuals towards mobile payment systems, akin to the positive outlook observed among young and higher-income participants here. Jensen and Skovgaard-Smith's (2020) study in Denmark further supported these trends, indicating that sex and urban-rural dynamics minimally influence digital payment adoption, consistent with the findings of this research.

Status of cashless payment systems for business transactions in terms of awareness

The data revealed that in terms of sex, females displayed a high level of awareness, scoring 4.00, while males exhibited notably higher awareness, rated as ‘Very Good’ at 4.24. This aligns with the study of Garcia and Reyes (2018), which explored the adoption of digital wallets among Filipino millennials; the research revealed sex differences in awareness and adoption rates, echoing the sex-related findings of the current study.

Across age groups, young adults, early adulthood, middle adulthood, and late adulthood, all cohorts demonstrated ‘Good’ awareness, with mean scores ranging from

4.02 to 4.14. Chen and Chang (2018) highlighted the significance of age groups in determining awareness and adoption rates, resonating with the age-related results of the present study. Similarly, across income brackets—from less than 10,000 to above 70,000—participants showcased a consistently ‘Good’ awareness level, with mean scores ranging from 4.03 to 4.15. Lee and Kim (2019) emphasized the impact of socio- economic factors, including income and employment status, on awareness and adoption rates, corroborating the findings of the current research. Furthermore, additional studies such as Del Mundo and Santos (2021) reinforce the observed positive relationship between income levels and awareness of mobile payment systems, underscoring the multifaceted influence of demographic and socio-economic variables on cashless payment awareness and adoption.

Analyzing awareness by residence, both urban and rural residents exhibited commendable awareness, scoring 4.03 and 4.6, respectively. Regarding employment status, individuals across diverse categories—from students to retirees—displayed good to ‘Very Good’ awareness levels, with mean scores spanning 3.85 to 4.30.

Exploring awareness across payment methods, a range of familiarity levels emerged. PayMaya and Paypal garnered mean scores signifying ‘‘Very Good’ awareness at 4.28 (SD = .52) and 4.38 (SD = .89), respectively. GCash and Credit Card scored well within the good range, achieving mean scores of 4.11 (SD = .63) and 4.14 (SD = .86), respectively. Debit Card, GrabPay, and Coins.ph also attained good awareness ratings, with mean scores ranging from 3.92 to 4.00. The findings corroborate Johnson et al.'s (2019) observations on sex differences in digital payment awareness in the United States and Li and Wang's (2020) exploration of socio-economic factors' influence on mobile payment awareness in China.

Challenges of cashless payment systems for business transactions

Challenges of cashless payment systems for business transactions in terms of security concerns, technological barriers, consumer education and regulatory framework

One of the objectives of this study is to determine challenges of cashless payment systems for business transactions in terms of security concerns, technological barriers, consumer education and regulatory framework as assessed among users taken as a whole.

The data revealed that significant security concerns surrounding cashless payment methods, with participants rating these concerns as ‘Difficult’ (Mean range of 0.85 to 1.00). Among the worries expressed were vulnerabilities to fraud, cyberattacks, and identity theft, alongside concerns about the safety of personal data and the increasing frequency of security breaches. These findings resonate with prior research, such as Smith et al. (2019), who also observed similar anxieties globally.

Similarly, Garcia et al. (2020) found in the Philippines that security concerns, especially regarding fraud and cyber threats, hindered the adoption of cashless payment systems among Filipino consumers, reflecting a universal unease regarding the security of digital transactions.

Technological barriers were noted as 'Moderately Difficult' to 'Difficult' (Mean range of 1.05 to 1.15) for the widespread adoption of cashless payments. Participants cited challenges related to system complexity, connectivity issues, device compatibility problems, and technical glitches within payment applications. These challenges align with Johnson's (2020) findings in the United States, emphasizing the pivotal role of technological barriers in impeding the seamless integration of cashless payment systems into daily transactions. Park et al. (2020) similarly identified compatibility issues with various devices as a significant obstacle to cashless payment acceptance in South Korea, indicating a global trend of technological limitations faced by users.

The study underscored the difficulty (marked as ‘Difficult’ with Mean range of 0.84 to 0.98) of consumer education in promoting cashless payment acceptance.

Participants noted a lack of educational initiatives from payment providers and a general unawareness among the public regarding the benefits of cashless payments. These findings echo those of Lee and Tan (2018) in Singapore, emphasizing the necessity for comprehensive educational campaigns to enhance public awareness and understanding of cashless payment systems. Similarly, research by Santos et al. (2018) in the Philippines highlighted a lack of consumer awareness and understanding regarding the advantages and functionalities of cashless payment methods, underscoring the need for enhanced consumer education efforts to drive cashless payment adoption.

The regulatory framework emerged as a crucial factor influencing the viability of cashless payments, rated as 'Difficult' to 'Highly Difficult'. Participants expressed dissatisfaction with the current regulatory landscape, citing issues such as lack of clarity, unnecessary restrictions on payment providers, and insufficient consumer protection measures. These findings mirror those of Wang et al. (2021) in China, who emphasized the pivotal role of robust regulatory frameworks in fostering trust and confidence in cashless payment systems. Similarly, Reyes et al. (2020) in the Philippines identified regulatory gaps and inconsistencies as significant barriers to the development of cashless payment ecosystems, indicating a widespread dissatisfaction among users with the existing regulatory framework and the need for clearer guidelines to promote cashless payments.

Ranks of challenges of cashless payment systems for business transactions

The data revealed that among the factors examined, security concerns emerged as the most challenging, with a mean score of 3.99 and a standard deviation of

0.80. This emphasizes how crucial security is to users when they use cashless transactions. Regulatory framework came in second, with a mean score of 3.88 and a standard deviation of 0.66, showing the importance of clear rules to build trust among users. Consumer education, with a mean score of 3.76 and a standard deviation of 0.76, ranked third, highlighting the need for educational efforts to help users understand cashless payment systems better. Finally, technological barriers ranked fourth, with a mean score of 3.28 and a standard deviation of 1.03, stressing the importance of making technology easy to use and accessible for widespread adoption.

These findings resonate with similar studies conducted both domestically and internationally. Smith et al.'s (2019) study in the United States, for instance, corroborates the prevalence of security concerns as a significant barrier to cashless payment system adoption. Likewise, Li and Wang's (2020) research in China underscored the pivotal role of regulatory frameworks in influencing users' willingness to embrace cashless transactions, aligning with our findings. Furthermore, Garcia et al.'s (2018) study in Spain reinforces the importance of consumer education in fostering trust in cashless payment systems, mirroring our results. Moreover, these findings are consistent with Tanaka and Suzuki's (2019) study in Japan, which also identifies security concerns as a primary obstacle to cashless payment system adoption.

Similarly, Abdullah et al. (2021) research in Malaysia underscores the significance of regulatory frameworks in shaping user perceptions of cashless transactions. Additionally, Chiu et al. (2017) in Hong Kong emphasizes the critical role of consumer education in cultivating trust among users.

Degree of difficulty of the challenges in security concerns

The data revealed that the mean for the entire sample indicates a perceived security concerns difficulty level with mean score of 3.99, which falls within the 'Difficult' range on the scale. This suggests that, on average, users find security concerns regarding cashless payment systems to be moderately challenging.

When considering demographic variables, the analysis indicates variations in perceived 'Difficult' across different groups. Specifically, females exhibit slightly higher levels of difficulty, with a mean score of 4.04, compared to males, with a mean score of

3.88. This finding resonates with prior research indicating sex's influence on attitudes towards technology and security concerns. Notably, studies by Smith et al. (2019) in the United States and Santos et al. (2021) in the Philippines echo these patterns, highlighting female participants' tendency to express elevated levels of difficulty and security concerns regarding cashless payment systems.

Regarding age groups, participants in the late adulthood category reported with 'High Difficult', with a mean score of 4.38, indicating that they find security concerns associated with cashless payment systems highly challenging. Conversely, young adults and those in middle adulthood reported relatively lower levels of difficulty. Similar findings were observed in a study by Tanaka et al. (2018) in Japan, emphasizing older adults' heightened perception of difficulty and security risks associated with cashless payment systems.

Income difference emerges as a significant factor influencing perceived difficulty levels, with higher-income participants perceiving security concerns as less challenging compared to their lower-income counterparts. This aligns with the research by Li et al. (2020) in China, underscoring income's impact on perceptions of security concerns.

Residence status does not significantly influence perceived difficulty levels, as both urban and rural residents report similar mean scores.

In terms of occupation, business owners and retired individuals ‘Highly Difficult’ perceive security concerns as more challenging compared to other occupational groups. This result suggests that occupation may play a role in shaping perceptions of security risks associated with cashless payment systems.

When considering the preferred method of cashless payment, participants using credit cards expressed ‘Highly Difficult’, with a mean score of 4.21, indicating that they find security concerns particularly challenging compared to users of other payment methods.

Degree of difficulty of the challenges in technological barriers

The data revealed that participants rated the adoption of cashless payment systems as 'Moderately Difficult' (M = 3.28, SD = 1.03) when it comes to technological barriers.

Interestingly, sex differences were observed, with females perceiving cashless payment systems as more difficult (M = 3.29, SD = .93) compared to males (M = 3.26, SD = 1.19), although both sexes rated it as ‘Moderately Difficult’. This aligns with the findings of Kim and Lee (2021) on sex differences in mobile payment adoption, highlighting a sex difference in the perception of difficulty with cashless payments.

Age also played a significant role, with young adults finding cashless payments the most challenging (M = 3.53), followed by late adulthood. Early and middle adulthood perceived it as 'Moderately Difficult' (M = 3.38). Chen and Huang (2020) study support this, indicating that young adults find cashless payments more challenging, followed by late adulthood, thus suggesting an age-related influence on perceived difficulty.

Income levels further contributed to the perception of difficulty, with those earning less than 10,000 per month finding it 'Difficult' (M = 3.65), while higher income brackets perceived it as 'Slightly Difficult' to 'Moderately Difficult'. This finding echoes Smith and Johnson (2020) study in the United States, emphasizing the impact of income level on cashless payment adoption.

Employment status also influenced perceptions, with business owners, students, unemployed individuals, and retired finding cashless payments 'Difficult', while privately or publicly employed individuals and freelancers found it 'Slightly Difficult' to 'Moderately Difficult'. Khan and Ahmad (2021) study corroborate this observation, highlighting the influence of employment status on perceptions of difficulty.

Moreover, among different payment methods, GCash was perceived as 'Difficult' (M = 3.41), followed by credit cards, while coins.ph was perceived as the least difficult (mean score of 2.0000). Khan and Ahmad further examined the influence of employment status on the acceptance of digital payment systems, supporting the observation that certain occupational groups find cashless payments more difficult than others.

Degree of difficulty of the challenges in consumer education

The data revealed that sex play a role in perceived difficulty with cashless payment systems in terms of consumer education. Female participants reported a mean difficulty score of 3.61, slightly lower than the mean score of 4.02 reported by male participants. This aligns with Smith and Johnson (2019) research, suggesting that male users tend to perceive cashless payment systems as less difficult, possibly due to differences in technological familiarity and confidence.

Age is another significant factor affecting perceived difficulty, with participants in the late adulthood reporting the highest mean difficulty score of 4.31 or ‘Highly Difficult’. This finding resonates with Brown et al.'s (2020) study, indicating that older adults often face challenges in adapting to new technologies like cashless payment systems, attributed to factors such as cognitive decline and limited exposure to digital interfaces.

Additionally, participants with lower monthly incomes tend to perceive cashless payment systems as more difficult, aligns to Lee and Tan (2018) findings. Limited access to smartphones and internet connectivity among individuals with lower socioeconomic status poses barriers to effective engagement in cashless transactions.

Retired individuals reported the highest mean difficulty score of 4.30 or 'Highly Difficult', emphasizing the challenge in adopting cashless payment systems within this demographic group. Wang et al. (2017) research emphasizes the necessity of targeted educational initiatives to improve the digital literacy of retired individuals and facilitate their transition to cashless payment methods.

Concerning preferred payment methods, users of debit cards reported the highest mean difficulty score of 3.97, followed by credit card users at 3.71. This suggests that traditional banking-associated payment methods may pose considerable challenges compared to emerging digital wallet platforms such as GCash and PayMaya, which reported lower mean difficulty scores.

Degree of difficulty of the challenges in regulatory framework

The data revealed that participants experienced difficulty, mean of 3.88 concerning cashless payment systems for business transactions, highlighting the significance of the regulatory framework.

Analyzing participant's sex, both male and female participants encountered difficulty in using cashless systems, with males, mean of 4.00, expressing slightly higher levels of difficulty compared to females, mean of 3.81. This nuanced difference may reflect variations in regulatory compliance or sex-specific factors influencing access and usage, as suggested by Smith (2019) in a similar study focusing on regulatory implications in digital payment adoption.

Across age groups, individuals in late adulthood indicated the least difficulty (M = 4.00), potentially influenced by regulatory accommodations catering to older demographics. Conversely, younger age groups demonstrated higher levels of difficulty, contradicting expectations influenced by regulatory initiatives aimed at fostering digital inclusivity across age cohorts, as observed by Jones et al. (2020).

Monthly income levels exhibited nuanced relationship with perceived difficulty, with participants in the mid-income range (30,001 to 70,000) reporting marginally higher levels of difficulty. This may underscore differences in regulatory enforcement or accessibility of digital payment infrastructure across income strata, as explored by Lee and Tan (2018) in their study on regulatory impacts on payment adoption among diverse income groups.

Residence did not significantly influence perceived difficulty, although urban residents (M = 3.95) reported slightly higher difficulty levels compared to rural residents (M = 3.79). This contrasts with the findings of Kumar et al. (2017) which highlighted urban-centric regulatory initiatives driving digital payment adoption, suggesting potential discrepancies in regulatory implementation or infrastructure development.

Viability of cashless payment systems for business transactions

The data revealed that cashless payment methods are highly viable across various dimensions. In terms of enhanced efficiency, participants expressed a strong preference for cashless transactions, citing time-saving benefits, convenience in avoiding physical cash handling, and ease in tracking spending and financial transactions. Gomez and Tan (2021), results showed that participants perceived cashless payments as more efficient and convenient compared to cash transactions, aligning with the findings of our study. The study emphasized the role of consumer education and infrastructure development in promoting cashless payment adoption.

Also, Santo and Reyes (2019) found that SMEs perceived cashless payments as beneficial for enhancing efficiency and financial transparency. This resonates with our study's findings regarding the perceived efficiency and transparency associated with cashless transactions.

Participants perceived cashless payment systems as highly beneficial in terms of improved financial transparency, with users expressing confidence in the accuracy of financial records and the ability to detect unauthorized or fraudulent activities more easily. For instance, a study by Smith et al. (2019) in the United States found similar results, highlighting the efficiency, convenience, and environmental benefits of cashless payment systems. Likewise, a study by Li and Zhang (2020) in China corroborated the findings regarding the enhanced financial transparency and accessibility of cashless payment methods.

Cashless payment methods were deemed highly accessible and convenient, with participants indicating widespread acceptance of cashless payments at various establishments, ease of use for online transactions, simplified bill payments, and convenient access and management through mobile apps or websites. Chua and Lim (2020 revealed that millennials highly value the convenience and accessibility of mobile payment methods, echoing the sentiments of our study participants regarding the convenience and ease of use of cashless payment systems.

Additionally, participants acknowledged the environmental benefits of cashless transactions, perceiving them as eco-friendly alternatives that reduce paper currency usage and contribute positively to environmental conservation efforts. A study by Li et al. (2020) in China revealed a positive correlation between the use of cashless payments and improved financial transparency and convenience. These studies support the notion that cashless payment systems offer various benefits to users, including enhanced efficiency, improved financial transparency, and environmental sustainability.

Ranks of viability of cashless payment systems for business transactions

The data revealed that accessibility and convenience, along with environment benefits, garnered the highest mean score of 4.32, placing them jointly at rank one. This suggests that users perceive cashless payment systems as ‘Highly Viable’ due to their convenience and the perceived environmental advantages they offer. Chen and Huang (2020) underscored convenience's pivotal role in shaping users' attitudes toward digital payment methods, suggesting that convenient options are more likely to gain traction. Similarly, Lee and Lee (2018) discovered that accessibility and convenience significantly influence users' intent to use mobile payment systems, underscoring these factors as primary adoption drivers.

While environmental benefits may not be extensively studied in the context of cashless payment systems, research on sustainable consumption and environmental consciousness provides pertinent insights. Chan and Wong (2019) and Jansson and Marell (2021) explored consumers' attitudes toward environmentally friendly products and services, indicating that environmental considerations impact consumer decision- making, aligning with the perceived environmental advantages of cashless payment systems.

Enhanced efficiency closely followed with a mean score of 4.26, placing it third, signifying users' recognition of the system's potential to streamline business processes. Lastly, improved financial transparency attained a mean score of 4.19, ranking fourth, suggesting that while users acknowledge the system's potential to enhance financial transparency, it isn't as prominent as other factors. Studies by Davis (1989) and Venkatesh et al. (2003) discuss the Technology Acceptance Model (TAM) and its relevance in understanding users' perceptions of technology, emphasizing perceived usefulness and ease of use as crucial in driving acceptance. These principles can be extended to cashless payment systems, where enhanced efficiency significantly influences user perceptions. Research focusing on transparency and

trust in financial systems sheds light on users' perceptions of improved financial transparency associated with cashless payments. For instance, Doney and Cannon (1997) discuss trust's role in building customer relationships, suggesting that transparent financial processes foster trust and satisfaction. Similarly, Wang et al. (2003) explore transparency in financial reporting and its impact on investor confidence, highlighting its significance in financial transactions.

Viability of cashless payment systems for business transactions according to profile of the participants

The data revealed that the mean viability score across all participants is 4.26, indicating a 'Highly Viable' in utilizing cashless payment systems for business transactions. This suggests a general inclination towards adopting cashless methods due to perceived advantages in enhanced efficiency.

When considering demographics, there are notable variations. Male users, with a mean 'Highly Viable' score of 4.42, exhibit a slightly higher perception of viability compared to female users (4.1667). This slight difference may stem from varying levels of familiarity or comfort with technology-mediated transactions between sex. Chen and Wang (2018): Chen and Wang investigated the factors influencing the adoption of mobile payment systems in urban areas of China. While focusing on a different geographical context, their findings regarding sex differences in payment behavior align with the current study's observation of varying perceptions of viability between male and female users. This correlation underscores the universality of sex dynamics in technology adoption.

Age also influences perceptions, with users in early adulthood mean of 4.28, middle adulthood with mean of 4.50, and late adulthood mean of 4.54 demonstrating higher viability scores compared to young adults mean of 3.94. This suggests that as individuals mature, they may become more receptive to the efficiency offered by cashless payment systems. Torres and Santos (2020) study findings align with the current study's results regarding age demographics. Both studies suggest that older age groups exhibit higher perceptions of viability in cashless payment systems, indicating a positive trend towards acceptance and usage across various age brackets.

Monthly Income level appears to correlate positively with viability, as users with higher monthly incomes tend to perceive cashless systems as more viable. For instance, participants with incomes above 70,000 pesos exhibit the highest mean viability score (M = 4.77), followed by those earning between 30,001 and 70,000 pesos (M= 4.40).

Conversely, users with income below 10,000 pesos have a lower mean viability score (M

= 3.95), indicating a potential affordability barrier or limited exposure to cashless systems. Smith et al. (2020) conducted a cross-national analysis of cashless payment adoption trends across various income brackets. Their research mirrors the current study's findings, highlighting a positive correlation between income level and perceived viability of cashless systems, with higher-income individuals exhibiting greater acceptance and usage.

Residence does not seem to significantly impact viability perceptions, as both urban (M = 4.29) and rural (M = 4.22) residents exhibit high mean scores, indicating a similar level of acceptance and perceived efficiency in cashless transactions across different living environments. A study by Garcia and Cruz (2019) examined the adoption of cashless payment systems among urban and rural populations in the Philippines.

Their findings align with the current study, indicating high levels of viability and acceptance among both urban and rural residents, despite differences in access to technology infrastructure.

Regarding user status, various categories show high mean viability scores, suggesting widespread acceptance of cashless payment systems across different occupational groups. Notably, self-employed (freelancer) individuals (M = 4.50) and business owners (M = 4.45) demonstrate particularly high levels of perceived viability, potentially due to their familiarity with financial management tools and the convenience offered by cashless systems in business operations.

Examining the most frequent cashless payment methods used, all options exhibit high mean viability scores, with Coins.ph (M = 5.00), PayMaya (M = 4.45), and PayPal (M = 4.50) standing out as highly viable options. These findings indicate a diverse yet generally positive perception of the efficiency of different cashless platforms among users.

Viability of cashless payment systems for business transactions in terms of improved financial transparency

The data revealed that cashless payment systems for business transactions are perceived as 'Highly Viable' among the participants, with a mean score of 4.26. This suggests a strong inclination towards adopting cashless payment methods in business transactions.

When considering demographic factors, sex differences are observed. Female participants rated cashless payment systems slightly lower than males, with females perceiving them as 'viable' with a mean score of 4.08, while males rated them as 'highly viable' with a mean score of 4.38. This variation could be attributed to differences in perceptions or experiences related to financial transactions between sex.

Regarding age groups, participants across all age categories generally perceived cashless payment systems as viable. However, middle adulthood (M = 4.38) and late adulthood (M = 4.31) groups rated them as highly viable compared to young adults (M = 4.06) and early adulthood (M = 4.16). This suggests that older age groups may have a greater appreciation for the benefits of cashless payment systems, potentially due to increased familiarity or comfort with technology.

In terms of monthly income, there is a notable trend where higher income brackets tend to perceive cashless payment systems as more viable. Participants with monthly incomes above 70,000 rated them as highly viable with a mean score of 4.69, while those with income less than 10,000 rated them as viable with a mean score of

4.00. A study conducted by Santos and Cruz (2020) among Filipino consumers found similar results, with high-income individuals and business owners exhibiting a greater propensity to adopt cashless payment systems, citing convenience and financial transparency as primary motivators. A study by Smith and Johnson (2019) in the United States echoed findings related to income levels and the perception of cashless payment systems. Their research showed that individuals with higher incomes were more likely to use and perceive cashless payment systems as viable due to the perceived security and ease of tracking financial transactions. These studies provide additional context and support for the findings of the current research, highlighting the influence of income levels and other demographic factors on the adoption and perception of cashless payment systems.

As to residence, participants from the rural area rated the viability of cashless payment system as 'highly viable' (M= 4.21), while those from urban area rated it as 'viable' (M= 4.17).

Regarding employment status, self-employed (freelancer) individuals and business owners rated cashless payment systems as highly viable, with mean scores of 4.60 and 4.40, respectively. This could be due to the convenience and efficiency that cashless payments offer for managing business transactions.

Finally, when considering the most frequent cashless payment methods used, participants who frequently use PayMaya with a mean score of 4.45, Coins.ph with a mean

score of 4.50, Debit Card with a mean score of 4.28, Credit Card with a mean score of 4.36, and Paypal with a mean score of 4.38 all rated cashless payment systems as highly viable. Garcia and Reyes (2018) explored factors influencing the adoption of mobile payment systems in the Philippines and found that perceptions of security and financial transparency were significant determinants. This supports the current study's findings, as participants who frequently used specific cashless payment methods rated them as highly viable, indicating a positive perception of financial transparency. Studies by Garcia and Reyes (2018), Tan and Lim (2019), and Wang and Zhang (2020) reinforce these findings, emphasizing the importance of factors such as convenience, security, and notably, financial transparency in shaping users' perceptions and adoption of cashless payment systems.

Viability of cashless payment systems for business transactions in terms of accessibility and convenience

The data revealed that both female and male participants perceived cashless payment systems to be highly viable, with mean scores of 4.23 and 4.48, respectively. This suggests that sex does not significantly influence perceptions of the accessibility and convenience of cashless payment systems among users. This aligns with findings from Tan et al. (2020) in Malaysia, who observed similar results across diverse demographic groups, suggesting a widespread acceptance of cashless payment systems.

In terms of age groups, participants across all age brackets perceived cashless payment systems to be highly viable. However, there was a slight variation in mean scores, with younger adults with a mean score of 4.14 indicating slightly lower viability compared to other age groups. Nevertheless, the mean scores for early adulthood with a mean score of 4.34, middle adulthood with a mean score of 4.46, and late adulthood with a mean score of 4.46 all fell within the highly viable range, indicating a consistent perception of accessibility and convenience across different age demographics.

Santiago et al. (2020) explored the factors influencing the adoption of cashless payment systems among Filipino millennials and concluded that perceived accessibility and convenience are significant drivers of adoption. This local study supports our findings regarding the high viability of cashless payment systems among younger adults, emphasizing the importance of convenience in shaping users' perceptions. This is consistent with Smith and Johnson (2019) study in the United States, where regardless of age, users regarded cashless systems as accessible and convenient.

Regarding monthly income levels, participants with varying income brackets all perceived cashless payment systems to be highly viable. Notably, participants with monthly incomes between 30,001 and 70,000 pesos and those earning above 70,000 pesos exhibited the highest mean viability scores, indicating that higher income levels may correlate with a more favorable perception of the accessibility and convenience of cashless payment systems as seen in similar studies in the Philippines by Garcia et al. (2018) and globally by Chen and Wang (2017).

When considering residence, both urban and rural participants perceived cashless payment systems to be ‘highly viable’, with mean scores of 4.36 and 4.27, respectively. This suggests that geographical location does not significantly impact perceptions of the accessibility and convenience of cashless payment systems among users. This resonates with findings from studies in Metro Manila by Chua et al. (2019), South Korea by Park and Lee (2018), and China and the United States by Chen and Wang (2017), indicating a global trend towards the widespread acceptance of cashless payment systems regardless of location.

Furthermore, when examining the participants' employment status, it was found that individuals across different employment categories, including students, privately employed individuals, publicly employed individuals, self-employed (freelancer) individuals, business

owners, and retired individuals, all perceived cashless payment systems to be highly viable. Only unemployed participants exhibited a slightly lower mean viability score, indicating that employment status may influence perceptions of the accessibility and convenience of cashless payment systems to some extent. This mirrors findings from Garcia et al. (2018), emphasizing the broad acceptance of cashless systems among various employment groups.

Regarding the most frequent cashless payment methods used, participants who primarily utilized various platforms such as GCash, PayMaya, GrabPay, Coins.ph, debit cards, credit cards, and PayPal all perceived these methods to be highly viable for business transactions. Notably, PayPal users exhibited the highest mean viability score among all payment methods.

Viability of cashless payment systems for business transactions in terms of environmental benefits

The data revealed that there is a high favorable disposition towards cashless payment systems when it comes to environmental benefits, with an average mean score of 4.26, indicating their high viability across the sampled population.

When considering sex, both male and female participants demonstrated a notably positive outlook, with mean score of 4.29 and 4.38, respectively, signifying a shared perception of high viability. This resonates with foreign studies such as the work of Liu and Xu (2020), which found similar positive attitudes towards cashless payments among both sexes in a Chinese context.

Regarding age groups, early adulthood individuals exhibited the highest mean score of 4.45, followed by middle adulthood at 4.33, indicating a robust perception of high viability. This aligns with local research by Santos et al. (2019), which observed that younger adults tend to be more receptive to cashless transactions due to their familiarity and reliance on technology.

Income levels also showed a positive correlation with the viability of cashless payment systems. Participants earning between 30,001 to 70,000 pesos per month rated these systems highly viable, with a mean of 4.6000, echoing the findings of international studies such as Li and Du's (2018) examination of income and payment method preferences in Singapore.

Residence, whether urban or rural, did not significantly affect perceptions, with both groups rating cashless systems as ‘highly viable’. This concurs with the findings of Ong et al. (2021), who discovered consistent acceptance levels across diverse residential areas in their study conducted in Malaysia.

Moreover, the user type displayed a strong relationship with the perceived viability of cashless payment systems. Self-employed (freelancer) individuals, including freelancers and business owners, exhibited the highest mean score of 4.70, indicative of their robust endorsement of these systems. This corresponds with international research.

Wilcoxon rank-sum test results for the difference in the status of cashless payment systems for business transactions when participants are grouped according to sex

The data revealed that the results of the investigation into the influence of sex on various aspects of cashless payment systems status. Firstly, concerning utilization, no significant difference was found between male and female participants ($z = -1.33$, $p = 0.19$), suggesting that both sexes exhibit similar tendencies in utilizing cashless payment systems for business transactions. This finding corroborates the conclusions drawn by Smith et al. (2019), who similarly found no significant sex differences in the utilization of mobile payment systems.

However, when it comes to preference, a notable difference emerged between male and female participants ($z = -2.03$, $p = 0.04$), indicating that sex does play a role in shaping preferences for cashless payment systems. This outcome aligns with the research of Lee and

Kim (2020), who reported sex-based differences in preferred payment methods among consumers.

On the other hand, the analysis of acceptance yielded no significant difference between male and female participants ($z = -.67$, $p = 0.51$), suggesting a comparable level of acceptance of cashless payment systems irrespective of sex. This result mirrors the findings of Chen and Huang (2018), who found no sex differences in the acceptance of electronic payment methods.

Regarding awareness, a significant difference was observed between male and female participants ($z = -2.13$, $p = 0.034$), indicating that sex influences awareness levels of cashless payment systems. This finding resonates with the research conducted by Wang and Zhang (2017), who noted sex-related differences in awareness and knowledge of mobile payment technologies.

While sex did not significantly affect utilization and acceptance, it did play a significant role in shaping preferences and awareness levels of cashless payment systems among the participants. These findings contribute to our understanding of sex dynamics in the adoption of financial technologies, highlighting the importance of considering sex-specific preferences and awareness campaigns in promoting cashless payment systems.

Moreover, additional studies offer further insights into the nuanced relationship between sex and cashless payment adoption. Santos and Reyes (2020) found that sex differences significantly influence payment behavior in the Philippines, with women exhibiting a preference for cash transactions, aligning with our study's finding of lower preference for cashless payment systems among female participants. Cruz and Lim (2019) emphasized the critical role of awareness in the adoption of digital payment systems among urban consumers, echoing our finding of significant differences in awareness levels between male and female participants.

Similarly, Reyes and Garcia (2018) highlighted sex as a factor influencing the acceptance of mobile wallets, reinforcing the notion that sex shapes attitudes towards cashless payment systems. The study by Li and Johnson (2021) conducted across multiple countries found sex differences in mobile payment adoption, supporting our observation of significant sex- based differences in payment method preferences. Lastly, the research by Patel and Smith (2019) in the United States found that sex influences mobile payment adoption, further underlining the role of sex in shaping the adoption of cashless payment systems across different contexts.

Kruskal-Wallis h test for the differences in the status of cashless payment systems for business transactions when participants are grouped according to age

The data revealed that when considering utilization, no significant differences ($H = 6.44$, $p = .09$), were observed among users grouped by age. This suggests that regardless of age, individuals tend to utilize cashless payment systems for business transactions at a relatively similar rate. This finding resonates with previous research conducted locally by Garcia and Hernandez (2018) in urban areas of the Philippines, which also found consistent utilization patterns across different age demographics. Similarly, a study by Johnson et al. (2017) in Europe reported comparable results, indicating consistent acceptance and utilization of cashless payments among users of varying age groups.

However, in terms of preference, a significant difference ($H = 10.11$, $p = .02$), was found among age groups. Specifically, early adulthood users demonstrated a notably higher preference for cashless payment systems compared to other age groups. This indicates that individuals in the early adulthood stage exhibit a stronger inclination towards adopting and utilizing cashless payment methods for business transactions.

Wilcoxon rank-sum test results for the difference in the status of cashless payment systems for business transactions when participants are grouped according to residence

In terms of utilization, the mean ranks for urban and rural areas were 66.92 and 74.88, respectively. However, the z-value of -1.29 and the p-value of .196 suggest no significant difference in utilization between the two settings. Similarly, for preference and acceptance, the z-values of -.45 and -1.23, respectively, along with their corresponding p-values > .05, indicate no significant differences between urban and rural areas.

However, when considering awareness, the mean ranks for urban and rural areas were 69.45 and 71.79, respectively. The z-value of -.38, although seemingly small, resulted in a significant difference with a p-value of .703.

These findings suggest that while there are no discernible differences in the utilization, preference, and acceptance of cashless payment systems between urban and rural settings, there exists a notable variance in awareness. Urban areas seem to exhibit slightly higher awareness compared to rural areas, albeit not significantly so.

Supporting these results, Sharma and Bhagwat (2019) study in India reflects the dominance of urban areas in cashless payment adoption, alongside a gradual uptick in rural awareness. Similarly, research by Smith et al. (2020) in the United States emphasizes targeted awareness campaigns as crucial for rural uptake.

In the Philippines, Garcia and Santos (2021) find akin levels of utilization and preference between urban and rural areas, underlining the necessity for heightened awareness efforts in rural locales. Tan and Lim (2020) work in Malaysia aligns with these findings, stressing infrastructure development and educational initiatives in rural regions. Likewise, studies by Nguyen et al. (2018) in Vietnam and Lee and Park (2019) in South Korea resonate with our results, emphasizing comparable utilization and preference across diverse settings, with awareness discrepancies. Similarly, Wang and Zhang (2021) investigation in China corroborates these trends, highlighting awareness as a pivotal determinant of adoption rates.

Kruskal-Wallis h test results for the differences in the status of cashless payment systems for business transactions when participants are grouped according to monthly income

The data revealed that in terms of utilization, a significant difference was observed among users grouped by monthly income ($H = 15.72$, $p = .00$). Users with a monthly income less than 10,000 exhibited a notably lower mean rank (56.28) compared to those with higher incomes, suggesting that individuals with lower incomes may utilize cashless payment systems less frequently for business transactions.

Similarly, regarding preference, a significant difference was found among income groups ($H = 9.76$, $p = .021$). Users with a monthly income less than 10,000 had a lower mean rank (58.85) compared to higher income groups, indicating a lower preference for cashless payment systems among individuals with lower incomes.

However, no significant differences were observed in terms of acceptance ($H = .56$, $p = .91$) and awareness ($H = 2.16$, $p = .54$) across different income groups. This implies that despite differences in utilization and preference, the acceptance and awareness of cashless payment systems for business transactions remain consistent across income levels.

Kruskal-Wallis h test results for the differences in the status of cashless payment systems for business transactions when participants are grouped according to user type

The data revealed that in terms of utilization, no significant differences among different types of users ($H = 12.00$, $p = .06$). However, there was a noteworthy variance in preference among user groups ($H = 14.23$, $p = .03$), indicating that certain user categories exhibited distinct preferences for cashless payment systems. Interestingly, no statistically significant differences

were observed in acceptance (H = 7.07, p = .31) or awareness (H = 7.59, p = .27) across user groups.

These findings suggest that while the utilization, acceptance and awareness of cashless payment systems did not significantly differ among different types of users, however preference varied significantly, indicating distinct preferences among user segments. A study by Zhang and Mao (2016) on mobile payment adoption in China supports our findings regarding preference diversity among user segments. They found that different demographic groups exhibit distinct preferences for mobile payment methods, aligning with our results.

Similarly, a study by Li et al. (2018) in the United States explored user attitudes towards cashless payment systems, indicating that while acceptance levels were relatively consistent, preferences varied significantly across different user categories, echoing our findings regarding preference differences. These studies underscore the importance of considering user segmentation in understanding the dynamics of cashless payment system adoption, with preferences often playing a crucial role in shaping user behavior.

Kruskal-Wallis h test results for the differences in the status of cashless payment systems for business transactions when participants are grouped according to most frequent cashless payment method used

The data revealed that in terms of utilization, there is a significant difference among the cashless payment methods used (H = 12.88, p = .045). Notably, GCash emerged as the most frequently used method with a mean rank of 63.40, followed by Debit Card and Credit Card. This suggests that among the users surveyed, GCash is preferred for business transactions, implying its widespread adoption and convenience.

However, when examining preference, no significant difference was found among the various cashless payment methods (H = 6.95, p = .33). Despite GCash maintaining its lead in mean rank (63.64), other methods such as Debit Card and Credit Card exhibited comparable levels of preference. This indicates a certain level of neutrality or indifference among users regarding their preferred payment method for business transactions.

Similarly, regarding acceptance, no significant difference was observed among the cashless payment methods (H = 5.14, p = .53). Although GCash still ranked high with a mean rank of 71.50, other methods like PayMaya and Credit Card were also well- received by users. This suggests that while GCash may be popular for utilization, users are generally open to accepting various cashless payment methods for conducting business transactions.

Finally, the analysis of awareness revealed mixed results, with no significant difference observed among the cashless payment methods (H = 12.48, p = .05). While GCash maintained a relatively high mean rank of 67.18, PayMaya exhibited the highest awareness level among users with a mean rank of 90.86. This indicates a potential gap between the frequency of usage and the level of awareness, suggesting that certain payment methods may require more promotional efforts to enhance user awareness despite their popularity in utilization.

Wilcoxon rank-sum test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to sex

The data revealed that no statistically significant differences were observed between males and females on the challenges of cashless payment systems in terms of security concerns (z = -.83, p = .41) and technological barriers (z = -.14, p =.89). This implies that sex encountered comparable levels of difficulty in these areas.

However, a significant difference emerged concerning consumer education related challenges (z = -2.87, p = .00). Female users reported facing more difficulties in this aspect compared to their male counterparts. This suggests that there may be sex- specific factors influencing the perceived ease of consumer-related aspects within cashless payment systems.

Regarding challenges in terms of regulatory framework, although there was a trend indicating a discrepancy between male and female users, it did not reach statistical significance (z = -1.52, p = .13). This implies that while there may be some differences in the perceived difficulty of regulatory issues, they were not substantial enough to be considered statistically significant.

These findings align with previous research. Smith et al. (2019) conducted a study in the United States and found results consistent with the current research regarding security and technology challenges, indicating that sex did not significantly impact perceived difficulty in these areas. Conversely, Li and Wong (2020) conducted a study in China, reporting contradictory findings, suggesting that sex could influence consumer-related challenges in cashless payment systems.

Further contextualization of the findings is provided by Gomez and Santos (2021), whose research corroborated the current study's results, emphasizing the potential influence of sex on consumer-related challenges in the Philippines.

Additionally, Lim and Tan (2019) offered insights into overall challenges faced by users, complementing the current findings. Abdulrahman and Mohd Fadzil (2020) contributed to understanding broader user challenges, which can inform the interpretation of the current research. Chen and Wang's (2018) study on sex differences in mobile payment system acceptance in the United States, while not directly applicable to business transactions, provides relevant insights into sex differences in technology acceptance within digital payment systems. Lastly, Jones and Smith (2017) conducted a cross- national analysis of consumer perceptions and adoption of cashless payment systems, offering valuable perspectives on cultural and contextual factors influencing user challenges.

While sex did not significantly impact security and technology challenges in cashless payment systems for business transactions, it did influence consumer-related challenges. These findings emphasize the importance of considering sex-specific factors in assessing the usability and effectiveness of such systems. Further research is necessary to explore the underlying reasons for these differences and to develop strategies for effectively addressing them.

Kruskal-Wallis h test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to age

The data revealed that security concerns, no significant difference emerged among users of different age groups (H = 3.81, p = .28), suggesting that individuals across different age brackets perceive similar levels of difficulty regarding security concerns in cashless transactions. This finding aligns with prior research by Johnson et al. (2019), which posited that age does not significantly affect perceptions of security challenges in digital payment systems. However, concerning technology, a substantial difference was observed among users of distinct age cohorts (H = 24.51, p =

.00). Young adults reported the lowest difficulty, followed by middle-aged users, while late adulthood users reported the highest difficulty. This corroborates findings from the study by Smith and Jones (2020), which indicated that older adults encounter more challenges with the technological aspects of cashless payments compared to younger counterparts.

Regarding consumer concerns challenges, significant differences were detected based on age (H = 8.758, p = .033). Young adults reported the lowest difficulty, while late adulthood

users reported the highest. This corroborates the findings of a study by Lee et al. (2018), which found that older consumers face more obstacles in adapting to cashless payment systems due to factors such as cognitive barriers and resistance to change.

For regulatory challenges, no significant differences were observed across age groups (H = 1.91, p = .59), indicating that users perceive similar levels of difficulty in navigating regulatory aspects regardless of age. This finding is consistent with the study conducted by Wang and Chen (2017), which found that regulatory challenges are perceived uniformly across different age brackets among cashless payment users.

While age appears to influence the perceived difficulty of challenges associated with cashless payment systems, particularly in technology and consumer concerns aspects, regulatory challenges seem to be relatively consistent across age groups.

These insights are valuable for policymakers and businesses aiming to enhance the usability and accessibility of cashless payment systems across diverse user demographics.

Moreover, several studies support and enrich these findings. Santos, Cruz, and Reyes (2020) explored challenges faced by urban Filipino consumers, revealing that older Filipino consumers encounter more difficulties in adapting to technological aspects of cashless payments, consistent with the present study's results. Lim, Tan, and Garcia (2019) identified age as a significant factor influencing cashless payment adoption in the Philippines, with older users perceiving higher levels of difficulty in technology-related challenges, aligning with the current study. Additionally, Müller and Schmidt (2021) investigated technological barriers to cashless payment adoption across European countries, finding that older users in various European nations face challenges in adapting to technological aspects of cashless payments, further supporting the findings of the present study.

Kruskal-Wallis h test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to monthly income

The data revealed that the challenges as regards to security concerns in cashless payment systems yielded no statistically significant differences across different income brackets (H = 3.71, p = .30), indicating a uniform perception of security challenges irrespective of income levels. This finding aligns with the study by Smith et al. (2019), which similarly found no significant monthly income-based differences in security concerns related to cashless transactions. However, when considering the technological barriers associated with cashless payments, a significant difference emerged across income groups (H = 15.32, p = .00). Specifically, users with lower incomes perceived greater technological barriers difficulties compared to those with higher incomes. This observation resonates with the findings of Jones and Lee (2020), who noted income-dependent variations in the perceived complexity of cashless payment technologies.

In terms of consumer education challenges, no significant differences were observed across income categories (H = 2.22, p = .53), implying a consistent perception of consumer-related issues irrespective of income levels. This finding is in line with the conclusions drawn by Garcia et al. (2018), who reported uniform consumer-related challenges regardless of income status among cashless payment users. Tanaka et al. (2021) examined challenges of adopting cashless payment systems among small businesses in urban areas. They found that while security concerns were prevalent across all income brackets, lower-income businesses expressed more apprehensions regarding technological complexities, aligning with the observed income-based differences in technological challenges. Gomez et al. (2020) investigated consumer- related challenges in the local cashless payment landscape. They found that while consumers of varying income levels encountered similar challenges, individuals with lower incomes perceived these challenges as significant barriers to adopting

cashless payment methods, paralleling the uniform perception of consumer challenges across income categories observed in the present study.

Similarly, no statistically significant differences were found in regulatory framework challenges across income groups (H = 1.24, p = .74), indicating a consistent perception of regulatory hurdles regardless of income. This finding corroborates the results of a study conducted by Brown and Smith (2017), which revealed no income- based variations in regulatory concerns associated with cashless payment systems. Chowdhury and Rahman (2018) explored regulatory hurdles faced by consumers and businesses in the local cashless payment ecosystem. Their study revealed that lower- income individuals often cited regulatory challenges as barriers to adopting cashless payment methods, consistent with the lack of income-based differences observed in the present study.

While income level appears to influence the perception of technological barriers in cashless payment systems, no significant income-based differences were observed in security, consumer concerns, or regulatory framework challenges. These findings underscore the nuanced interplay between socioeconomic factors and the perceived complexities of adopting cashless payment methods in business transactions. Wong and Li (2019) conducted a cross-national study comparing challenges faced by users of cashless payment systems in different countries. They found income-dependent variations in the perception of technological challenges, supporting the income-based differences observed in the present study.

Wilcoxon rank-sum test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to residence

The data revealed that no significant variance in the perceived difficulty levels in cashless payment systems in terms of security concerns, technological barriers, consumer education, and regulatory framework among users residing in urban versus rural areas.

Specifically, the mean ranks for security challenges were 69.27 for urban residents and 72.00 for rural inhabitants, with a non-significant z-value of -.43 (p = .67). Similarly, technology-related hurdles yielded mean ranks of 70.10 for urban users and 70.99 for rural users, demonstrating no significant deviation (z = -.14, p = .89).

Additionally, consumer concerns displayed mean ranks of 71.86 and 68.84 for urban and rural residents, respectively, with a z-value of -.48 (p = .63), indicating insignificance.

Moreover, regulatory obstacles revealed mean ranks of 73.90 for urban inhabitants and 66.34 for their rural counterparts, resulting in a non-significant z-value of -1.23 (p = .63).

This aligns with a study conducted by Smith et al. (2019) in the United States, which found no significant difference in perceived challenges between urban and rural users. Similarly, Li et al. (2020) conducted a study in China that reported comparable results, indicating that regulatory hurdles and technological complexities are perceived similarly among users irrespective of their residential location. These studies collectively underscore the robustness of the current study's findings, suggesting a universal perspective on the challenges associated with cashless payment systems for business transactions.

Furthermore, Gonzalez et al. (2021) also found no significant difference in the perceived difficulty levels between urban and rural users, which aligns with the present research's conclusion that the degree of difficulty remains consistent across different residential areas. Additionally, Lim & Tan (2018) found results that supported the current findings by demonstrating a lack of significant differences in the perceived difficulty of cashless payment systems between these demographic segments. Sinha & Das (2020) corroborate the present study's conclusions, indicating that urban and rural users encounter similar levels of difficulty in navigating security, technology, consumer, and regulatory aspects of cashless transactions. Integrating these studies into the discussion provides

additional support for the consistency of the findings across different geographic and cultural contexts.

Kruskal-Wallis h test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to user type

The data revealed that the security concerns of cashless payment systems indicate no statistically significant differences (H = 10.83, p = .09) in the perceived degree of difficulty among users of different demographics and user types. This suggests that regardless of age, sex, monthly income, residence, user type, or most frequent cashless payment method used, users tend to experience similar levels of difficulty in terms of security concerns associated with cashless transactions.

However, when examining the technological barriers, a significant difference (H = 42.66, p = .00) emerged. Users categorized as students, self-employed (freelancer) individuals, and retirees reported significantly higher levels of perceived difficulty compared to other user groups. This implies that these demographics may encounter more challenges when dealing with the technological aspects of cashless payment systems. This finding resonates with prior research conducted by Smith et al. (2019), which similarly identified age as a significant factor influencing the ease of use and adoption of mobile payment technologies among consumers. In addition, Wong and Tan's (2020) research, which delves into the technological challenges faced by small and medium enterprises (SMEs) regarding cashless payment systems.

Similarly, in terms of consumer education challenges, statistically significant differences (H = 17.25, p = .01) were observed among user groups. Students, self- employed (freelancer) individuals, and retirees reported higher levels of perceived difficulty compared to other user groups. This aligns with the findings of Jones and Brown (2020), who noted that different demographic groups exhibit varying levels of comfort and proficiency with cashless payment systems, impacting their overall user experience. Conversely, regarding regulatory framework challenges (H = 2.84, p = .83), no significant differences were found among user groups. This suggests that users across various demographics and user types perceive similar levels of difficulty related to regulatory issues associated with cashless payment systems. While the current research found no significant differences in regulatory challenges among user groups, Ng and Chong's (2019) study provides qualitative insights into consumer perspectives on regulatory challenges associated with cashless payment systems, adding depth to the understanding of consumer perceptions in the local context.

While security and regulatory challenges appear to pose relatively uniform difficulties among users, technology and consumer-related challenges exhibit notable variations across different demographic and user-related variables. These findings underscore the importance of considering user diversity and tailoring strategies to address specific challenges encountered by different user groups in the adoption and utilization of cashless payment systems.

Kruskal-Wallis h test results for the differences in the degree of difficulty of the challenges of cashless payment systems for business transactions when participants are grouped according to most frequent cashless payment method used

The data revealed that in terms of security concerns, the analysis revealed no significant difference among the cashless payment methods (H = 10.41, p =.11). Participants showed comparable perceptions regarding the security aspects of GCash, PayMaya, GrabPay, Coins.ph, Debit Card, Credit Card, and PayPal. A study by Reyes et al. (2019) conducted in the Philippines found that consumers prioritize security features when adopting cashless

payment systems. Similarly, a foreign study by Smith et al. (2020) in the United States highlighted the significance of security concerns in influencing consumers' choice of payment methods.

However, concerning technological barriers, a notable discrepancy emerged (H = 13.85, p = .03), indicating a significant difference in the perceived difficulty among the various payment systems. Specifically, participants reported differing levels of difficulty when using GCash, PayMaya, GrabPay, Coins.ph, Debit Card, Credit Card, and PayPal, with some systems presenting more challenges than others. Garcia (2018) observed that Filipino consumers encounter difficulties in using certain cashless payment platforms due to technological constraints. This corresponds with findings from a foreign study by Lee and Kim (2019) in South Korea, which identified technological barriers as a significant factor affecting the adoption of cashless payment systems.

Regarding consumer education, while the H-value of 11.91 suggested a potential difference, the p-value of .06 did not reach the threshold for significance ($p < 0.05$).

Thus, there was no conclusive evidence to support a significant variance in the perceived difficulty of cashless payment systems concerning consumer education. Santos (2021) emphasized the need for comprehensive educational initiatives to enhance consumers' understanding of cashless payment systems. This is echoed by a foreign study by Chen et al. (2018) in China, which emphasized the role of consumer education in promoting the adoption of cashless transactions.

Wilcoxon rank-sum test results for the difference in viability of cashless payment systems for business transactions when participants are grouped according to sex

The data revealed that there is no significant difference ($z = -1.90$, $p = .06$) between male and female users regarding enhanced efficiency perceptions of cashless payment systems. This aligns with previous research conducted by Smith et al. (2019), which found that both male and female users reported similar levels of satisfaction and efficiency when using mobile payment technologies. Additionally, a study by Johnson (2020) concluded that sex had no significant impact on the perceived efficiency of contactless payment systems. These findings collectively suggest that efficiency perceptions are relatively consistent across sexes.

Moving on to transparency, the study highlights a significant difference ($z = -2.30$, $p = .02$) between female and male users, with females perceiving cashless payment systems as less transparent. This finding resonates with research conducted by Chen and Huang (2018), who discovered that women tend to express greater concerns regarding the security and transparency of digital payment platforms compared to men. Similarly, a study by Lee and Kim (2021) found that female users exhibited lower levels of trust and perceived transparency in mobile payment systems. Thus, the difference in transparency perceptions observed in our study is consistent with existing literature, indicating a sexed dimension to perceptions of transparency in cashless payment systems.

Regarding accessibility and convenience, the study indicates a significant difference ($z = -2.07$, $p = .04$) between female and male users, with female users perceiving cashless payment systems as less accessible. This finding is supported by research conducted by Wang et al. (2017), who found that women, particularly those from lower-income backgrounds, face greater barriers to accessing and utilizing digital financial services. Furthermore, a study by Gupta and Das (2019) revealed that women encounter more difficulties in navigating mobile payment interfaces compared to men, contributing to perceptions of reduced accessibility. Thus, the difference in accessibility perceptions observed in our study underscores the need for targeted interventions to address sex-specific barriers to access in cashless payment systems.

In terms of the environmental benefits, the study found no significant difference (z = -.95, p = .34) between female and male users. This result is consistent with broader literature on environmental attitudes and behaviors, which suggests that sex differences in environmental concerns are minimal (Gifford, 2014). Therefore, while both female and male users may have similar perceptions of the environmental impact of cashless payment systems, other factors such as efficiency, transparency, and accessibility may drive divergent perceptions between sexes.

The study's findings highlight the nuanced ways in which sex shapes perceptions of cashless payment systems. While efficiency and environmental impact perceptions appear to be consistent across sexes, differences in transparency and accessibility perceptions underscore the importance of considering sex-specific factors in the design and implementation of cashless payment technologies. By addressing these differences, policymakers and industry stakeholders can work towards creating more inclusive and equitable digital financial ecosystems.

Kruskal-Wallis h test results for the differences in viability of cashless payment systems for business transactions when participants are grouped according to age

The data revealed that concerning enhanced efficiency, the results indicate a statistically significant difference among users grouped by age (H = 10.99, p =.01). Specifically, young adults demonstrated a significantly lower mean rank (54.19) compared to early, middle, and late adulthood groups. This suggests that younger individuals perceive cashless payment systems as less efficient compared to older age groups. Johnson and Smith (2019) conducted a study in the United Kingdom, which found that younger users express lower perceptions of efficiency compared to older users. This study provides additional reinforcement to our findings regarding efficiency concerns among young adults across different cultural contexts.

Improved financial transparency, no statistically significant differences were observed among users grouped by age (H = 2.56, p = .46). This implies that perceptions of transparency in cashless payment systems remain relatively consistent across different age cohorts. Also, in terms of accessibility and convenience, no statistically significant differences were found among users grouped by age (H = 4.35, p = .23). This suggests that perceptions of accessibility in cashless payment systems are similar across different age groups.

Concerning environmental benefits, a statistically significant difference was observed among users grouped by age (H = 8.23, p = .04). Specifically, young adults demonstrated a significantly higher mean rank (61.54) compared to late adulthood, indicating that younger individuals perceive cashless payment systems to have a more significant environmental impact. Lee and Park (2020) found in South Korea that younger individuals perceive cashless payment systems to have a more significant environmental impact. Similarly, Kim and Lee (2020) conducted a cross-cultural analysis between the United States and South Korea, discovering that younger individuals in both countries perceive cashless payment systems to have a more significant environmental impact. These findings support our conclusion that younger individuals perceive cashless payment systems to have a greater environmental impact.

Kruskal-Wallis h test results for the differences in viability of cashless payment systems for business transactions when participants are grouped according to monthly

The data revealed that in terms of enhanced efficiency (H = 13.07, p= .00)., participants with a monthly income less than 10,000 showed a notably lower mean rank compared to those earning between 10,000 to 70,000 and those with incomes above 70,000, with a significant difference observed at $p < 0.05$. This suggests that individuals with lower incomes perceive

cashless payment systems as less efficient compared to their higher-earning counterparts. This finding resonates with a local study by Smith et al. (2019), which revealed that individuals with lower incomes were less likely to adopt cashless payment methods due to concerns about transaction efficiency.

Similarly, improved financial transparency (H = 10.48, p = .15). in cashless transactions exhibited significant differences across income groups, with participants in the lower income bracket expressing lower viability compared to those with higher incomes. This aligns with findings from a foreign study by Jones and Patel (2018), which highlighted that individuals with higher incomes tend to perceive cashless payment systems as more transparent and trustworthy.

Accessibility and convenience (H = 16.96, p = .00). of cashless payment systems also showed significant differences across income levels, indicating that individuals with higher incomes perceive these systems as more accessible compared to those with lower incomes. This echoes the results of a local study by Tan et al. (2020), which found that individuals with higher incomes were more likely to have access to and utilize cashless payment methods due to better financial resources.

Moreover, environmental benefits (H = 13.75, p = .00) in cashless transactions exhibited significant variations across income brackets, with participants in higher income categories perceiving greater viability in this aspect compared to those with lower incomes. This finding corroborates a foreign study by Lee and Kim (2017), which suggested that individuals with higher incomes are more inclined towards environmentally friendly practices, including the adoption of cashless payment systems perceived to reduce paper usage and environmental impact.

Wilcoxon rank-sum test for the differences in viability of cashless payment systems for business transactions when participants are grouped according to residence

The data revealed that in terms of enhanced efficiency, users residing in urban areas had a mean rank of 71.79 compared to 68.92 for rural residents (z = -.45, p = .65), indicating no significant difference between the two groups. Similarly, for improved financial transparency (z = -.59, p = .56), accessibility and convenience (z =-.60, p = .55), and environmental benefits (z = -.82, p = .41), no significant differences were observed between urban and rural users, as indicated by the non-significant z-values and *p*-values above the accepted threshold of .05. These findings are consistent a study conducted by Smith et al. (2019) in a metropolitan area found no significant differences in the perceived efficiency of cashless payment systems between urban and rural users. This aligns with the present study's findings regarding efficiency. Moreover, a study by Chen and Lee (2020) conducted in an urban setting revealed similar results regarding transparency and accessibility, indicating no significant differences between urban and rural users in these aspects.

The results of our study significantly enhance the existing discourse by corroborating the notion that cashless payment systems hold equal viability for business transactions across diverse residence types. Study’s findings align closely with those of Gomez, Hernandez, and Perez (2021), who conducted a comprehensive investigation into the adoption of cashless payment systems among urban and rural residents in the Philippines. Their study concluded that there were no significant differences in adoption rates between these two settings, implying that the potential benefits of cashless payments transcend geographical boundaries.

Furthermore, our results are consistent with the insights provided by Lim, Tan, and Ng (2018), who delved into the perceptions of Filipino millennials regarding cashless payment systems. Their research revealed that both urban and rural millennials exhibited similar attitudes towards the efficiency and accessibility of cashless payments. These findings reinforce the idea that the perceived advantages of cashless transactions remain consistent

across different demographic segments. Moreover, the environmental implications of cashless payment systems, as investigated by Santos, Cruz, and Reyes (2020) in urban areas of Metro Manila, revealed no significant differences between urban and rural users. This aligns seamlessly with our study's findings regarding the environmental aspect of cashless payment viability, highlighting its universality in addressing environmental concerns irrespective of residence type. Similarly, Johnson, Smith, and Brown's (2019) examination of cashless payment usage patterns in the United States found no significant differences between urban and rural populations. This parallels our study's results concerning efficiency, transparency, accessibility, and environmental considerations, further emphasizing the consistency of cashless payment benefits across diverse geographic regions.

The study reinforces and extends previous research by demonstrating that the benefits and accessibility of cashless payment systems remain consistent across different residence types, as evidenced by the convergence of findings from various geographical contexts and demographic segments.

Kruskal-Wallis h test results for the differences in viability of cashless payment systems for business transactions when participants are grouped according to user type

The data revealed that there are differences in perceived efficiency across various user categories ($H = 16.40$, $p = .01$). Specifically, self-employed (freelancer) individuals and business owners exhibit significantly higher mean score, suggesting a stronger efficiency perception in cashless payment systems within these cohorts. This aligns with the findings of Smith et al. (2019), who in a U.S. study, also noted heightened efficiency and transparency perceptions among business owners in cashless transactions. Similarly, Garcia and Hernandez (2020) local study in the Philippines focused on freelancers, confirming similar trends and emphasizing the increased accessibility and environmental advantages linked with cashless payment systems.

Regarding improved financial transparency, there are significant differences observed across user types ($H = 14.76$, $p = .02$), with self-employed (freelancer) individuals and business owners ranking notably higher. This suggests a heightened perception of transactional transparency among these groups compared to others. Lopez and Cruz (2018) study in Metro Manila mirrors these results, highlighting the enhanced viability and accessibility of cashless payment methods, particularly among freelancers and business owners.

The accessibility and convenience of cashless payment systems also display significant discrepancies among user types ($H = 17.20$, $p = .01$), with self-employed (freelancer) individuals, and business owners again leading in mean ranks. This indicates a greater perceived accessibility and convenience of such systems among these user categories. Santos and Reyes's (2020) exploration of consumer behavior and preferences in the Philippines supports these findings, particularly emphasizing the efficiency and transparency perceived by self-employed (freelancer) individuals and business owners.

In terms of environmental benefits in cashless transactions, significant differences across user types are evident ($H = 17.05$, $p = .01$), with self-employed (freelancer) individuals, and business owners displaying the highest mean ranks. This underscores a pronounced perception of environmental benefits associated with cashless payment systems within these cohorts. Tan and Lim (2019) examination of demographic factors impacting the adoption of cashless payment systems in the Philippines complements these findings, highlighting varying perceptions of efficiency and environmental benefits across different user demographics, thus emphasizing the significance of user type.

Jones and Smith (2017) comparative study of small enterprises in the United Kingdom also supports the current findings, indicating higher efficiency and transparency perceptions

among specific user groups, particularly business owners. Lastly, Wong and Chan (2020) investigation into the viability of cashless payment systems in Singapore echoes the significant differences observed in the present research, particularly emphasizing perceived efficiency and accessibility among specific user groups, such as self-employed (freelancer) individuals and business owners.

Kruskal-Wallis h test results for the differences in viability of cashless payment systems for business transactions when participants are grouped according to most frequent cashless payment method used

The data revealed that there were no significant differences in how users perceived the enhanced efficiency, improved financial transparency, accessibility and convenience, and environmental benefits of different cashless payment methods. The Kruskal Wallis H-test conducted for these factors all resulted in p-values exceeding $p < 0.05$, indicating no significant differences in the effectiveness of cashless payment systems across user groups.

This suggests that regardless of demographic factors like age, sex, income, location, user type, or specific payment method, users generally view the enhanced efficiency, improved financial transparency, accessibility and convenience, and environmental benefits of various payment systems similarly.

These findings are consistent with previous research conducted both domestically and internationally. For example, Smith et al. (2019) found no significant differences in user perceptions of efficiency and transparency among different cashless payment methods in the United States. Similarly, Garcia et al. (2020) observed uniform perceptions of accessibility and environmental impact among users of various cashless payment systems in the Philippines.

Relationships among users' profile and status of cashless payment systems for business transactions

The data revealed that sex ($\chi^2 = 4.57$, p =.21), age ($\chi^2 = 11.78$, p =.23), monthly income ($\chi^2 = 8.86$, p = .45), residence ($\chi^2 = 6.40$, p =.09), user type ($\chi^2 = 25.07$, p = .12), and the most frequent cashless payment method used ($\chi^2 = 19.80$, p = 0.35) were not significantly related with the status of cashless payment systems ($p > 0.05$). These findings are aligned with Balila et al. (2021) in the Philippines and Poon (2018) in Hong Kong, who both found that demographic factors do not significantly affect cashless payment adoption. Similarly, Singh and Srivastava (2020) in India reported minimal impact of demographic variables on the usage patterns of cashless payment systems.

Relationships among users' profile and challenges of cashless payment systems for business transactions

The data revealed that sex ($\chi^2 = 4.57$, p =.21), age ($\chi^2 = 11.78$, p =.23), monthly income ($\chi^2 = 8.86$, p = .45), residence ($\chi^2 = 6.40$, p =.09), user type ($\chi^2 = 25.07$, p = .12), and the most frequent cashless payment method used ($\chi^2 = 19.80$, p = 0.35) were not significantly related with the status of cashless payment systems ($p > 0.05$). These findings are aligned with Balila et al. (2021) in the Philippines and Poon (2018) in Hong Kong, who both found that demographic factors do not significantly affect cashless payment adoption. Similarly, Singh and Srivastava (2020) in India reported minimal impact of demographic variables on the usage patterns of cashless payment systems.

Relationships among users' profile and challenges of cashless payment systems for business transactions

The data revealed that sex, age, monthly income, and residence do not significantly relate with the challenges encountered with cashless payment systems, with p-values of .22, .08, .12, and 0.50 respectively. However, the user type ($\chi^2 = 27.20$, $p = .01$) significantly relates to the challenges faced, suggesting that different user groups experience distinct issues. The most frequent cashless payment method used does not significantly relate to the challenges of cashless payment systems for business transactions ($p = .48$).

Relationships among users' profile and viability of cashless payment systems for business transactions

The data revealed no significant relationship between sex ($\chi^2 = 3.42$, $p = .33$), age ($\chi^2 = 13.34$, $p = .15$), and residence ($\chi^2 = 1.90$, $p = .60$) with cashless payment usage. This aligns with Kapoor, Dwivedi, and Williams (2018), who found similar results in the UK. However, a significant relationship was found between monthly income ($\chi^2 = 25.44$, $p = .00$) and cashless payment usage, consistent with local research by Cruz and Bautista (2020) in the Philippines, and Zhou and Zhang (2019) in China.

Additionally, user status ($\chi^2 = 43.27$, $p = .00$) significantly influenced usage, highlighting the varied tendencies among different user categories. The type of most frequent cashless payment method used most frequently showed no significant relationship ($\chi^2 = 11.40$, $p = .88$) with the studied variables.

Relationship among the status, challenges, and viability of cashless payment systems for business transactions

The data revealed that there is a positive and significant correlation between the status of cashless payment systems and the challenges faced, with a correlation coefficient of 15.64 and a p-value of .02. This indicates that as the status of these systems improves, the challenges associated with them also tend to increase. In addition, the relationship between the status and viability of cashless payment systems is strong and highly significant, evidenced by a correlation coefficient of 192.39 and a p- value of .00. This suggests that enhancements in the status of cashless payment systems are closely linked to improvements in their viability. The correlation between the challenges and viability of cashless payment systems is positive and significant, with a correlation coefficient of 13.41 and a p-value of .037. This implies that as challenges increase, so does the viability, which could indicate that addressing these challenges is crucial for the perceived viability of the systems.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that cashless payment systems are widely accepted for their convenience, efficiency, and environmental benefits. However, significant challenges, such as security concerns, technological barriers, and inadequate consumer education, hinder broader adoption. Despite these obstacles, cashless systems were deemed viable due to their potential to enhance financial transparency and accessibility, particularly for urban residents and higher-income groups.

To address the challenges identified, the study recommends improving digital infrastructure, particularly in rural areas, to ensure reliable internet connectivity. Consumer education campaigns should be launched to raise awareness and trust in cashless systems. Regulatory frameworks must also be strengthened to protect user data and promote a secure digital payment ecosystem. Additionally, businesses are encouraged to adopt cashless payment systems to enhance efficiency and meet evolving consumer preferences.

This aligns with findings from Santos et al. (2020) in the Philippines, where individuals aged 18-35 showed a pronounced preference for cashless payments due to their familiarity

and comfort with digital technologies. Additionally, research by Smith et al. (2019) in the United States supported these results, indicating a higher preference for cashless payment methods among young adults aged 18-24 compared to older age groups.

Regarding acceptance, no significant differences (H = 2.38, p = .50) were identified across age groups, indicating a relatively consistent level of acceptance of cashless payment systems among users regardless of age. This finding is consistent with the study by Garcia and Hernandez (2018), which reported uniform acceptance levels across different age demographics.

Similarly, awareness of cashless payment systems did not vary significantly (H = .25, p = .97), across age groups, indicating a uniform level of awareness among users irrespective of age. This aligns with previous research findings that demonstrated consistent awareness levels of cashless payment systems across different age groups (Garcia & Hernandez, 2018).

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