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EXPLORING ASNAF PERCEPTIONS OF QR CODE AND NFC PAYMENTS: AN EMPIRICAL STUDY

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Abstract:

Emerging technology, such as QR Code and NFC payment gateway, exemplified by services like Maybank's MAE and Touch 'n Go NFC, is transforming the landscape of digital financial transactions. This empirical research, titled "Exploring Asnaf Perceptions of QR Code and NFC Payments: An Empirical Study," delves into the attitudes and experiences of Asnaf beneficiaries regarding the adoption and utilization of these innovative payment methods within the context of fintech and Asnaf management. Employing a user-centric approach and employing qualitative data analysis through thematic analysis, the research aims to gain a comprehensive understanding of Asnaf beneficiaries' perspectives. The study encompasses a comprehensive review of pertinent literature, underscoring the significance of fintech in Asnaf management, and delineating the theoretical framework. Qualitative research methods, including semi-structured interviews and focus groups with selected Asnaf beneficiaries, are used to extract and interpret recurring themes in the qualitative data. The results of the analysis provide valuable insights into Asnaf beneficiaries' perceptions and preferences concerning QR Code and NFC payments. The findings of this study have considerable implications for enhancing Asnaf management and guiding fintech strategies to better meet the unique needs and preferences of Asnaf beneficiaries in the digital era. Moreover, the research underscores the importance of incorporating a user-centric approach in fintech studies and demonstrates the effectiveness of thematic analysis as a qualitative research method.

Keywords:

Asnaf, Fintech, NFC, QR Code

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Introduction

In the rapidly advancing era of digital technology, the global reliance on these innovations is undeniable. Institutions and organizations that fail to acknowledge and adapt to this progress risk lagging behind their competitors and strategic partners (Subri et al., 2023). It is imperative for entities to stay abreast of technological advancements to maintain relevance and competitiveness in the modern landscape (Hasrul, 2019). Within the dynamic domain of digital financial technologies, the advent of QR Codes and Near Field Communication (NFC) payment gateways, exemplified by services like Maybank's MAE and Touch 'n Go NFC, has triggered substantial transformations in financial transactions. These technologies promise heightened convenience, security, and efficiency, reshaping the digital financial landscape significantly (Dapp et al., 2014). While the potential benefits are widely acknowledged, it is crucial to consider the perspectives and experiences of diverse population segments, including Asnaf beneficiaries, to ensure that the adoption and utilization of these innovations align with the broader community's diverse needs and preferences (Ismail, 2019).

The adoption of digital payment gateway technologies, specifically QR Code and NFC, among Asnaf beneficiaries in Perlis, Malaysia, is marked by numerous challenges related to user familiarity, expectations, and satisfaction. The alignment of users' initial expectations with their actual experiences significantly impacts satisfaction and continued usage. Instances of disconfirmation, where user expectations diverge from their experiences, highlight the necessity for targeted improvements in user-centric design and awareness campaigns.

Asnaf beneficiaries, individuals eligible for Zakat, constitute a substantial segment of society where financial inclusion holds paramount importance. Gaining insights into their perceptions and experiences with emerging fintech solutions, such as QR Code and NFC payments, is crucial for optimizing the efficacy of these technologies in the realm of Asnaf management (Nashwan et al., 2023). The varying levels of user familiarity necessitate tailored approaches to cater to the diverse needs of Asnaf beneficiaries. The central challenge revolves around refining the user experience, addressing disconfirmation issues, and advancing user-centric design to bridge the gap between expectations and experiences.

This research aims to delve into the nuanced dynamics of digital payment gateway adoption, seeking to identify solutions that facilitate the effective utilization of these technologies among Asnaf beneficiaries in Perlis, Malaysia. The study provides an overview of the transformative potential of QR Code and NFC payments within the broader fintech landscape. Emphasizing the research's significance in the realms of financial inclusion and technology adoption, the paper outlines its objectives, methodology, and the theoretical framework underpinning the study. It underscores the value of a user-centric approach and qualitative data analysis through thematic analysis. Overall, this research emphasizes the relevance and importance of investigating this area within the contexts of both fintech innovation and the distinctive needs of Asnaf beneficiaries.

Literature Review

History of Payment Gateway, QR Code, and NFC

The historical evolution of payment gateways, QR Code, and Near Field Communication (NFC) technologies demonstrates the relentless progress in the digital finance sector. Payment gateways have a rich history dating back to the emergence of online commerce in the 1990s (Gomber at el., 2018). The pioneering system was PayPal, which revolutionized

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e-commerce payments. QR Codes, on the other hand, have their roots in Japan in the 1990s and became prevalent with the widespread adoption of smartphones (Turban, 2017). NFC technology, initially developed in the 1980s, gained momentum in the mid-2000s with the advent of contactless payments. This historical perspective highlights the foundational technological advances that paved the way for the contemporary adoption of these payment methods (Goldfinch 2018).

Zakat Institutions' Adoption of Digital Payment Gateways

Zakat institutions, essential for the equitable distribution of Zakat funds to eligible recipients, have progressively adopted the convenience and transparency offered by digital payment gateways. As an Islamic social finance tool, Zakat is increasingly leveraging financial technology to expedite the collection and distribution of funds (Salma Al Azizah & Choirin, 2019). Through online transactions, Zakat payers can now calculate their Zakat amounts, make payments, and track their contributions effortlessly via online platforms (Ahmad et al., 2014). Consequently, financial technology offers a flexible and user-friendly system that delivers efficient, transparent, and swift services to its users (Salma Al Azizah & Choirin, 2019). These institutions acknowledge that technology can streamline the collection and disbursement of Zakat funds, reducing administrative costs and enhancing the speed and efficiency of transactions. Many Zakat organizations have integrated QR code and NFC payment options into their platforms, facilitating digital contributions for contributors (Fadhilah, 2023). These digital innovations empower donors to fulfil their religious obligations while simultaneously promoting financial inclusion and transparency within the Zakat system.

Challenges and Implications of Digital Payment Gateway

The adoption of digital payment gateways within the context of Zakat management brings about both challenges and significant implications. Although zakat collection has increased year on year, the problem of zakat distribution has to be addressed and improved for the benefit of the asnaf (Lubis et al., 2011). Challenges include security concerns, data privacy, and the digital divide, where some Asnaf beneficiaries may lack access to the necessary technology (Jauhari et al., 2023). There are also concerns regarding the potential loss of the personal touch associated with traditional Zakat transactions. However, the implications are equally noteworthy. Digital payment gateways can enhance transparency by creating an immutable record of transactions on a blockchain, ensuring that funds reach the intended beneficiaries (Coppi & Fast, 2019). Additionally, the cost savings from reduced administrative overhead can result in a more significant portion of Zakat funds being directed to those in need (Owoyemi, 2020). The promotion of financial inclusion is a key implication, as these technologies enable Asnaf beneficiaries to access funds more conveniently, fostering self-sufficiency (Fadhilah, 2023).

This literature review underscores the historical context and evolution of payment gateways, QR Codes, and NFC technologies, highlighting their integration into Zakat institutions. Additionally, it recognizes the challenges and significant implications of digital payment gateways, illustrating their potential to transform the landscape of Zakat management, ultimately benefiting both the contributors and recipients in the digital age (Uddin & Sultana, 2022).

User Acceptance Theories and Models

User acceptance theories and models are pivotal in comprehending the adoption of emerging technologies. Within the scope of "Assessing User Acceptance and Adoption of Emerging

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Technologies in Malaysia: A User-Centric Approach," several pertinent theories and models come into focus. The Technology Acceptance Model (TAM), initially formulated by Davis in 1986, serves as a foundational theory for comprehending technology adoption (Davis, 1989). It posits that users' intention to embrace technology significantly hinges on their perceptions of its ease of use and utility. In the context of these technologies, Malaysian users may evaluate the simplicity of integrating this technology and its perceived potential to enhance resource allocation and service provision (Ghaleb at el., 2021).

Another relevant model is the Expectation Confirmation Model (ECM), which primarily centres on the post-adoption phase of technology acceptance. ECM takes into consideration factors such as user contentment, perceived performance, and disconfirmation, all of which wield influence over continued technology utilization (Thong et al., 2006). In the context of these technologies, ECM proves instrumental in ascertaining whether user expectations align with their actual experiences, a critical aspect for the enduring adoption of such technologies.

Furthermore, the Social Cognitive Theory, formulated by Bandura (2001), underscores the importance of social influences and observational learning in the process of technology adoption. In Malaysia, users may be inclined to adopt these technologies if they observe their peers benefiting from these systems and witnessing their advantages within their social networks (Nashwan, 2023). These theories and models provide a robust framework for evaluating user acceptance and adoption of these technologies within the Malaysian context.

ECM stands out as an apt choice for this research, underpinned by several compelling reasons. ECM's pronounced focus on post-adoptive behaviour aligns seamlessly with the examination of user acceptance of these technologies within the Malaysian context. This framework resonates with the core objective of comprehending how initial user expectations and ensuing experiences shape sustained technology use. By assessing facets such as user satisfaction, perceived performance, and the degree to which expectations are met, ECM stands well-prepared to offer invaluable insights into the potential for widespread acceptance and utilization of these emerging technologies (Jameaba, 2023).

Moreover, ECM's recognition of the dynamic nature of user acceptance is especially relevant when studying evolving technologies. Considering that user perceptions and experiences are subject to change over time, ECM forms a robust foundation for assessing how user acceptance and behaviours evolve as they interact with these technologies.

In addition, ECM plays a crucial role in providing a nuanced understanding of user acceptance, recognizing that a user's intent to use technology is shaped not only by the technology itself but also by their subjective post-adoptive experiences. This comprehensive perspective aligns seamlessly with the user-centric approach of the upcoming study, which is dedicated to delving into the intricacies of user attitudes, experiences, and satisfaction regarding these technologies within the Malaysian context (Ghaleb at el., 2021).

In summary, the Expectation Confirmation Model has been chosen for its suitability in investigating post-adoptive behaviour, adaptability to evolving user experiences, and its comprehensive comprehension of the intricate dynamics of user acceptance. By employing ECM, the study aspires to contribute invaluable insights into the factors influencing the adoption of these technologies in Malaysia and aims to enhance their user-centric design and implementation.

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Methodology

The research methodology employed for this study is qualitative, with a primary focus on adopting a user-centric approach and utilizing the Expectation Confirmation Model (ECM). The research methodology centers on conducting in-depth interviews with a purposive sample of five selected respondents in Malaysia. These interviews are designed to delve deeply into the nuances of user acceptance and adoption of virtual profiling technologies within the Malaysian context. The qualitative data collected through these interviews will be rigorously analyzed using thematic analysis. This analytical process aims to unveil recurring themes, patterns, and insights within respondents' perspectives, ultimately providing a rich and nuanced understanding of user perceptions. The study's conclusion will be informed by the findings derived from the thematic analysis, offering valuable insights into the implications of user perceptions for the successful adoption of virtual profiling technologies in Malaysia.

Research Design

The research design for this study adopts a comprehensive approach to investigate user perceptions and acceptance of digital payment gateway technologies, specifically focusing on QR Code and NFC systems within Malaysia. The research design begins with a user-centric sampling process, ensuring diversity among the participants, who possess prior experience with similar applications. Data collection involves in-depth interviews with carefully selected respondents, offering insight into various aspects of technology acceptance. The collected data is subjected to a dual-tiered analysis, initially employing the Expectation Confirmation Model (ECM) to assess post-adoption user behavior and satisfaction, followed by thematic analysis to uncover recurring patterns and themes in the responses. The anticipated results will provide valuable insights for user-centric improvements in the implementation of digital payment gateway technologies, and the research will culminate in the presentation of findings and a conclusion summarizing key insights and their implications within the Malaysian context.

The research will employ a qualitative research approach, specifically utilizing a user-centric methodology as per Figure 1. Purposive sampling will be utilized to select participants with prior experience and familiarity with digital payment gateway systems, particularly those who have used similar applications, including QR Code and NFC technologies. In this study, five respondents will be interviewed, each representing different backgrounds and experiences, which will provide a well-rounded perspective on user perceptions and acceptance of digital payment gateways, QR Code, and NFC technologies in Malaysia.

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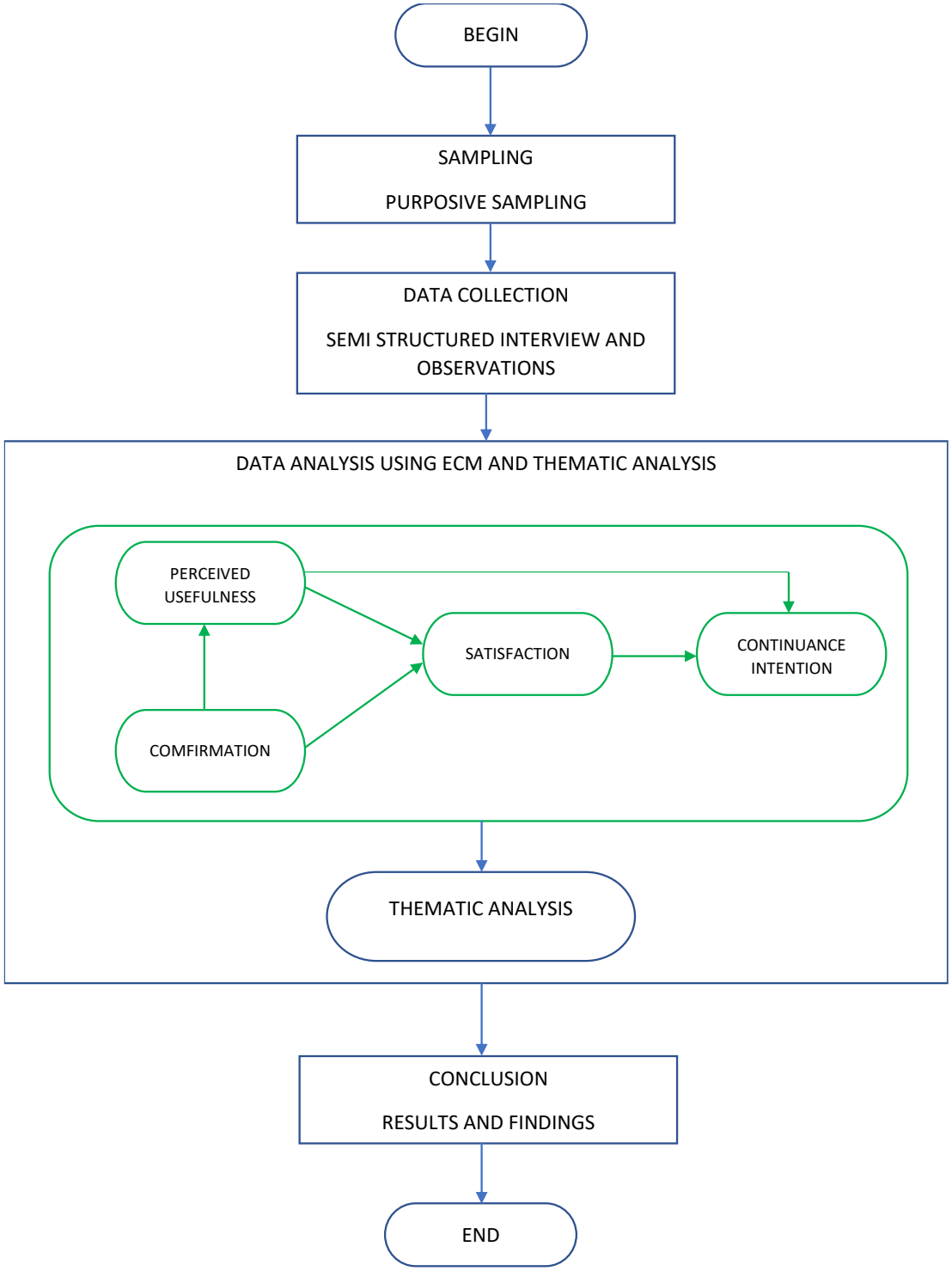

Figure 1. Research Framework of ECM with Thematic Analysis

To analyze the data collected from these respondents, the research will utilize the Expectation Confirmation Model (ECM) as the guiding framework. This model is particularly relevant for understanding post-adoption user behavior and satisfaction related to digital payment gateway technologies like QR Code and NFC. Thematic analysis will be conducted to gain deeper insights into the responses, allowing for the identification of recurring patterns, themes, and trends.

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The anticipated results will provide a comprehensive understanding of how users perceive and accept digital payment gateways, QR Code, and NFC technologies in the Malaysian context, considering their prior experience with similar applications. These findings will contribute valuable insights to guide further advancements and user-centric improvements in the implementation of digital payment gateway systems, QR Code, and NFC technologies. The research conclusion will summarize the key findings and their implications, shedding light on the perceptions and acceptance of the respondents regarding these technologies.

Purposive Sampling

The data collection method for this research adopts a meticulous approach, employing in-depth interviews with a carefully chosen group of five respondents who are Asnaf beneficiaries. These respondents are intentionally selected using a purposive sampling approach, which is a deliberate strategy aimed at ensuring diversity across a spectrum of backgrounds, demographics, and experiences. The primary objective is to acquire a comprehensive understanding of how these respondents perceive and accept digital payment gateway technologies, with a specific focus on QR Code and NFC. By deliberately selecting respondents from a varied pool of backgrounds, this method ensures that the research captures a holistic view of user perspectives, accounting for the multifaceted factors that influence the adoption of these technologies. This approach contributes to the richness and depth of the research findings and enhances the ability to draw meaningful insights from the diverse experiences and perspectives of Asnaf beneficiaries.

The sampling approach, characterized by purposive sampling, was thoughtfully designed to ensure the inclusion of a diverse and representative group of respondents. This methodological choice allowed for the selection of individuals from various backgrounds, with different levels of familiarity, and varied experiences, providing a comprehensive and multifaceted view of user perspectives within the Asnaf community. The diversity within the sample enriches the research findings, offering a broad spectrum of insights that are essential for a holistic understanding.

Data Collection

In the context of the research on user perceptions and acceptance of digital payment gateway technologies, specifically focusing on QR Code and NFC, among Asnaf beneficiaries in Perlis, Malaysia, a set of ten semi-structured interview questions has been formulated. These questions have been carefully designed to elicit comprehensive insights from the respondents. The initial set of inquiries seeks to understand the participants' experiences with digital payment gateways, including the frequency of use, the ease of use, and the perceived advantages. This encompasses inquiries about challenges and concerns related to the context of Asnaf beneficiary status, as well as their familiarity with the security features and safety measures applied during financial transactions. Moreover, the questions delve into the extent to which the adoption of QR Code and NFC technologies has influenced the efficiency of resource allocation and service provision for Asnaf beneficiaries. Additionally, the social and cultural factors shaping user acceptance, the potential to bridge the digital divide, and the alignment of prior expectations with actual experiences are explored. The final question invites participants to offer recommendations and suggestions for enhancing the user-centric design and implementation of digital payment gateway technologies, drawing from their own experiences and perceptions. These semi-structured questions have been thoughtfully constructed to yield

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a comprehensive understanding of the participants' perspectives, thereby contributing valuable insights to the research.

The data collection approach, primarily relying on in-depth interviews, facilitated the collection of qualitative data that is rich and deeply insightful. Through these interviews, respondents shared detailed narratives, providing an in-depth exploration of their experiences, challenges, and benefits when utilizing digital payment gateways. The user-centric approach to data collection ensured that the data gathered authentically captured the perspectives of Asnaf beneficiaries, bringing to the forefront the complexities of their acceptance and expectations.

Data Analysis

The research employs a dual-pronged data analysis approach, commencing with the application of the Expected Confirmation Model (ECM) followed by thematic analysis. This approach is vital in comprehending the perspectives and acceptance levels of Asnaf beneficiaries in Perlis, Malaysia, regarding digital payment gateway technologies, specifically QR Code and NFC. The ECM, a well-established theoretical framework, focuses on Expectation (E), Confirmation (C), and Satisfaction (S). It gauges respondents' initial beliefs and anticipations concerning these technologies, encompassing factors like ease of use, perceived advantages, and potential challenges. Confirmation subsequently assesses whether their experiences align with these expectations, while Satisfaction measures the degree of contentment or dissatisfaction. Disconfirmation plays a pivotal role in identifying any disparities between expectations and actual experiences, potentially leading to expectations of improvement. Following the ECM analysis, thematic analysis is conducted to unearth recurring themes and patterns within the qualitative data derived from in-depth interviews. This qualitative exploration delves deep into the respondents' narratives, unveiling the underlying determinants, challenges, and benefits that mold their perspectives and acceptance of digital payment gateways. This intricate blend of ECM and thematic analysis affords a comprehensive examination of the respondents' experiences and outlooks, facilitating an in-depth understanding of user satisfaction and areas where enhancements are anticipated.

By amalgamating these two analytical approaches, the research aspires to provide a well-rounded and holistic understanding of how Asnaf beneficiaries in Perlis perceive and embrace digital payment gateway technologies. This multi-pronged approach contributes to the development of a comprehensive conclusion and valuable insights for the improvement of user-centric designs and the implementation of these technologies, ultimately enriching the financial management experiences of Asnaf beneficiaries.

Conclusion

The research conclusion is the culmination of a methodological approach that encompasses careful consideration of sampling, data collection, and data analysis techniques. These methodological elements have been pivotal in illuminating the intricate dynamics of Asnaf beneficiaries' perceptions and acceptance of digital payment gateway technologies in Perlis, Malaysia.

In conclusion, the research findings are a product of a robust and comprehensive methodological approach. The deliberate sampling strategy, user-centric data collection, and the combined use of ECM and thematic analysis have yielded a profound understanding of how Asnaf beneficiaries in Perlis perceive and embrace digital payment gateway technologies. These insights are of great significance in shaping the research conclusion, which not only

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encapsulates the findings but also provides valuable recommendations for the enhancement of user-centric design and the implementation of these technologies, ultimately enhancing the financial management experiences of Asnaf beneficiaries.

Main Result

Table 1. Demographic of Respondents

Respondent	Age	Gender	Education	Income Level	Location	Occupation	Technology Familiarity	Previous Experience
Aisha	28	Female	Bachelor's degree	Middle-income range	Perlis	Teacher	Intermediate	Intermediate, frequently use specific app
Amir	35	Male	Diploma	Middle-income range	Perlis	Marketing Professional	Low	Low experience
Fatimah	42	Female	-	Lower-income range	Perlis	Small Business Owner	Low	Low experience
Hadi	23	Male	College Student	Lower income range	Perlis	University Student	Tech Enthusiast, frequent user	Highly experience, frequently use digital payment
Siti	55	Female	-	Lower income range	Perlis	Retired	Low	Limited experience, new to digital payments

Table 1 shows five diverse respondents were interviewed in Perlis, Malaysia, to investigate their perceptions and acceptance of digital payment gateway technologies, with a particular focus on QR Code and NFC systems. The demographic profiles of the respondents varied considerably: Aisha, a 28-year-old female with a bachelor's degree and intermediate technology familiarity; Amir, a 35-year-old male marketing professional with low technology familiarity; Fatimah, a 42-year-old female small business owner with limited technology experience; Hadi, a 23-year-old male university student with high technology familiarity; and Siti, a 55-year-old retired female with low technology familiarity and limited prior experience with digital payments. These distinct profiles encompassed differences in age, education, occupation, technology familiarity, and prior experience, contributing to a comprehensive exploration of user perspectives and acceptance of digital payment gateways in the Malaysian context.

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Table 2. Summary of Responses from Interview

Question	Aisha's Response	Amir's Response	Fatimah's Response	Hadi's Response	Siti's Response
Q1: Experience with Digital Payment Gateways	Intermediate familiarity; Frequent use, a few times a week	Low familiarity; Infrequent use due to occupation	Low familiarity; Sparingly used for business transactions	Highly experienced; Frequent daily use	Limited experience; Rarely used for financial transactions
Q2: Ease of Use of Digital Payment Gateways	Relatively easy to use; Convenience and connectivity challenges	Challenging due to low familiarity; Convenience is limited	Somewhat challenging due to low familiarity; Limited convenience	Extremely easy to use; Speed and efficiency; No significant challenges	Somewhat challenging due to limited experience; Convenience is yet to be fully realized
Q3: Advantages of QR Code and NFC for Financial Transactions	Speed and efficiency; Improved access and expenditure tracking	Potential efficiency, but not frequently used; Limited impact	Potential efficiency, but not frequently used; Limited impact	Speed, convenience, and efficiency; Greatly improved access and management of funds	Potential advantages in efficiency; Not fully realized yet
Q4: Challenges or Concerns with Digital Payment Gateways as Asnaf Beneficiary	Limited acceptance in some places; Need for cash at times; Older folks' adaptation challenges	Limited acceptance in some places; Less of a challenge due to infrequent use	Limited acceptance; Sparingly used, so less impact on access to funds as Asnaf beneficiary	Limited concerns, but not all places accept these technologies; Can be an issue for some	Limited acceptance; Less impact due to limited experience
Q5: Familiarity with Security Features	Somewhat familiar; Secure phone, PIN, fingerprint, double-check transactions, use reputable apps	Limited familiarity; Basic precautions like using secure networks, but not highly experienced	Limited familiarity; Limited exposure to security measures due to limited use	Highly familiar; Secure networks, multi-factor authentication, regular app updates, comprehensive measures	Limited familiarity; Limited exposure to security measures yet; Potential impact
Q6: Enhancement of Efficiency in Resource Allocation for Asnaf Beneficiaries	Improved efficiency, but room for awareness and accessibility improvement	Potential for efficiency, but not personally witnessed substantial impacts yet	Potential for efficiency, but personal experience limited due to sparing use	Significant improvement in efficiency; Speed and accuracy; Greatly benefits Asnaf beneficiaries	Potential for efficiency; Not witnessed substantial impacts yet due to limited experience
Q7: Influence of Social or Cultural Factors on Use and Acceptance	Influenced by peers; Growing social acceptance, especially among the younger generation	Influence by peers to some extent; Social acceptance growing, but less impact due to infrequent use	Less influenced by social factors; Sparing use may lead to future social acceptance influence	Influenced by peers' positive experiences; Social factors play a significant role	Less influenced by social factors due to limited experience; Potential impact

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Q8: Potential to Bridge the Digital Divide Among Asnaf Beneficiaries	Potential with more awareness and accessibility in rural areas; More common in urban areas	Potential to bridge the divide with awareness and accessibility in rural areas; Currently more common in urban settings	Potential for efficiency, but due to sparing use, not substantial impact on resource allocation	Strong belief in bridging the divide, especially in rural areas where it can greatly benefit Asnaf beneficiaries	Potential for bridging the divide; Personal witnessing not substantial yet due to limited experience
Q9: Alignment of Perceptions and Experiences with Expectations	Expected speed but challenges in some places; Differences between expectations and experiences	Neutral expectations; Limited use aligns with expectations; Differences exist	Limited expectations due to sparing use; Potential is there but not fully realized	Positive expectations exceeded by experiences; Efficiency and convenience were better than expected	Limited expectations due to sparing use; Differences may exist but not identified yet
Q10: Recommendation for Improving User-Centric Design and Implementation	Recommendations for more awareness campaigns and training sessions, especially in rural areas	Recommendations for awareness campaigns, user-friendly design, and accessibility in rural areas	Recommendations for raising awareness and ensuring user-friendliness; Accessibility in rural areas is crucial	Recommendations for continued improvement in user-friendliness and accessibility; More outreach and training sessions	Recommendations for awareness campaigns and user-friendly design, especially for users new to digital payments

The table provides a comprehensive summary of the responses from five diverse respondents who participated in semi-structured interviews focused on their perceptions and acceptance of digital payment gateway technologies, with a specific emphasis on QR Code and NFC. Aisha, Amir, Fatimah, Hadi, and Siti offered unique insights based on their varying levels of familiarity, frequency of use, and experiences with these technologies. Their responses reveal a spectrum of opinions regarding the ease of use, advantages, challenges, and familiarity with security features. Furthermore, the table highlights their perspectives on the potential to bridge the digital divide among Asnaf beneficiaries, as well as the alignment of their expectations with actual experiences. Their recommendations for enhancing user-centric design and implementation underscore the importance of awareness, user-friendliness, and accessibility, particularly in rural areas. Overall, this table encapsulates a range of valuable insights, shedding light on the multifaceted nature of user perceptions and acceptance of digital payment gateways among Asnaf beneficiaries in Perlis, Malaysia.

In the data analysis process, the Expected Confirmation Model (ECM) served as a structured framework for evaluating user acceptance and post-adoption behavior. With its focus on Expectation (E), Confirmation (C), and Satisfaction (S), ECM allowed for a comprehensive assessment of the alignment between initial expectations and actual experiences. In conjunction, thematic analysis was employed to uncover latent patterns and recurring themes within the qualitative data, offering a qualitative layer of insights that complemented the ECM analysis.

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Table 3. ECM Data Analysis

ECM Data Analysis	Respondents	Expectation (E)	Confirmation (C)	Satisfaction (S)	Disconfirmation (D)	Continued Use/Behaviour (CUB)
Aisha	Intermediate familiarity; Frequent use, a few times a week	Frequent use and ease of use confirmed with some connectivity challenges; Expected frequent use and ease of use align with expectations	Satisfied with experience based on frequent use and ease of use with minor challenges	Connectivity challenges may not fully meet expectations, but overall satisfaction leads to an expectation of improvement	Likely to continue frequent use, expecting improvement in connectivity and user-friendliness	Willingness to continue using digital payment gateways
Amir	Low familiarity; Infrequent use due to occupation	Infrequent use and challenges confirmed; Expected infrequent use and some challenges align with expectations	Neutral satisfaction as personal impact not substantial; Disconfirmation regarding witnessing substantial impact	Not witnessing substantial impact yet, which prompts an expectation of improvement in user-friendliness and awareness campaigns	Likely to continue infrequent use, expecting increased user-friendliness and awareness campaigns to improve the experience	Willingness to continue using digital payment gateways
Fatimah	Low familiarity; Sparingly used for business transactions	Sparing use and potential challenges confirmed; Expected sparing use and potential challenges align with expectations	Neutral satisfaction as sparing use limits impact; Disconfirmation regarding not fully realizing potential efficiency	Potential for efficiency not fully realized, leading to an expectation of enhanced user-friendliness and awareness campaigns	Likely to continue sparing use, expecting enhanced user-friendliness and more awareness campaigns to realize the potential	Willingness to continue using digital payment gateways
Hadi	Highly experienced; Frequent daily use	Frequent use, ease of use, and significant advantages confirmed; Expected frequent use, ease of use, and significant advantages align with expectations	Highly satisfied with experience, with limited concerns regarding acceptance but expecting more improvement	Limited concerns regarding acceptance and a strong belief in potential improvements; Expectation of continuous improvements	Highly likely to continue frequent use, with a strong belief in further improvements and growing acceptance	Willingness to continue using digital payment gateways

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Siti	Limited experience; Rarely used for financial transactions	Limited use, challenges, and potential advantages confirmed; Expected limited use, challenges, and potential advantages align with expectations	Neutral satisfaction as limited experience limits impact; Disconfirmation regarding potential advantages not fully realized	Potential advantages not fully realized, leading to an expectation of enhanced user-friendliness and awareness campaigns	Likely to continue limited use, expecting improved user-friendliness and more awareness campaigns to realize the potential and witness substantial impacts	Willingness to continue using digital payment gateways

Table 4. Thematic Analysis

Thematic Analysis	Description
Alignment of Expectations and Confirmation	- Alignment between respondents' initial expectations (E) and actual experiences (C) leads to satisfaction and continued use.
User Satisfaction and Continued Use	- User satisfaction (S) strongly influences the willingness to continue using digital payment gateways (CUB).
Disconfirmation and Expectations of Improvement	- Disconfirmation (D), where expectations and experiences do not align, prompts respondents to anticipate improvements (CUB).
Role of User-Friendliness and Awareness Campaigns	- Disconfirmation also triggers expectations of enhanced user-friendliness and awareness campaigns to improve the overall experience.
Varying Familiarity and Impact on Perception	- Respondents' familiarity levels influence their overall perceptions, with higher familiarity contributing to satisfaction and acceptance.

This table summarizes the key themes and their respective descriptions based on the thematic analysis using the Expected Confirmation Model (ECM) in conjunction with the responses of the five respondents. These themes collectively contribute to a comprehensive understanding of user acceptance and provide insights for user-centric improvements in the implementation of digital payment gateway technologies.

Conclusion

The analysis of the thematic findings from the study regarding the perceptions and acceptance of digital payment gateway technologies, specifically QR Code and NFC, among Asnaf beneficiaries in Perlis, Malaysia, illuminates essential insights. Firstly, the alignment between respondents' initial expectations (E) and their actual experiences (C) emerged as a pivotal factor influencing user acceptance. Instances where expectations were met by experiences led to heightened satisfaction and a willingness to continue using these technologies. Aisha and Hadi, exemplifying this alignment, showcased higher satisfaction levels and a stronger inclination toward technology adoption.

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Secondly, user satisfaction (S) played a crucial role in influencing the willingness to continue using digital payment gateways. Notably, Hadi, who expressed considerable satisfaction, exhibited a strong intention to continue using these technologies. Satisfaction appears to be a potent driver for continued use and user acceptance. Thirdly, the theme of disconfirmation (D) emerged as a common experience among respondents. Disconfirmation reflects disparities between expectations and experiences and was a prevalent factor driving expectations of improvement (CUB). This suggests that users not only acknowledge areas for enhancement but also anticipate ongoing improvements to facilitate greater user-centric experiences. Furthermore, the role of user-friendliness and awareness campaigns was underscored within the Disconfirmation (D) and Continued Use/Behaviour (CUB) themes. Respondents who reported disconfirmation also expressed expectations of improved user-friendliness and enhanced awareness campaigns. These findings accentuate the significance of user-centric design and effective educational endeavours to enrich user experiences and bridge the divergence between expectations and real-world experiences.

The analysis of findings concerning the perceptions and acceptance of digital payment gateway technologies, specifically QR Code and NFC, among Asnaf beneficiaries in Perlis, Malaysia, underscores several recommendations to enhance user acceptance and facilitate the successful implementation of these technologies. Firstly, there is a paramount need to ensure the alignment of users' initial expectations with their real-world experiences. This can be achieved through the provision of accurate and comprehensive information about the capabilities and functionalities of digital payment gateways. Such alignment is vital in cultivating user satisfaction and fostering a higher likelihood of continued technology use. Secondly, a user-centric approach that prioritizes ease of use, reliability, and user-friendly design should be emphasized. This involves the continuous monitoring of user feedback and the prompt resolution of issues that impede satisfaction. Thirdly, addressing areas of disconfirmation, where user expectations do not align with their experiences, is of utmost importance. Identification of these areas and the subsequent implementation of necessary improvements, such as refining user interfaces, enhancing educational resources, and streamlining the onboarding process, is crucial to promote technology acceptance.

Additionally, to bridge the expectation-experience gap, investment in user-friendly design and awareness campaigns is recommended. User-friendly interfaces, as well as intuitive and user-centric design, can significantly enhance overall user experiences. Simultaneously, awareness campaigns can educate users about the benefits and functionalities of digital payment gateways, ensuring that they harness the full potential of these tools. Lastly, recognizing the role of user familiarity is vital. Tailored approaches that cater to users with varying degrees of familiarity, offering appropriate levels of support and education, can enhance user acceptance. Novice users may require comprehensive onboarding and training, while experienced users may prefer advanced features and customization options. By implementing these recommendations, the adoption and utilization of digital payment gateway technologies can be facilitated, ultimately enhancing financial management experiences and empowering Asnaf beneficiaries in Perlis, Malaysia (Author, Year).

In conclusion, the study's thematic analysis of user acceptance among Asnaf beneficiaries in Perlis emphasizes the importance of aligning expectations with experiences, ensuring user satisfaction, addressing areas of disconfirmation, and enhancing user-friendliness and awareness campaigns to promote the adoption of digital payment gateway technologies. The varying levels of user familiarity also influence perceptions and acceptance, highlighting the

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need for tailored strategies to accommodate users with differing degrees of technological familiarity and proficiency. These insights contribute to the knowledge base and underscore the significance of user-centric approaches for the successful implementation of digital payment gateway technologies.

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