The Impact of Mobile Payment Systems and User Interface Design on Customer Adoption and Transaction Volume in E-commerce Companies in Jakarta

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Article Info

ABSTRACT

This study investigates the impact of mobile payment systems and user interface design on customer adoption and transaction volume in e-commerce companies in Jakarta. Utilizing a quantitative approach, data were collected from 140 respondents and analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3). The findings indicate that both mobile payment systems and user interface design significantly and positively influence customer adoption. Additionally, customer adoption was found to have a positive impact on transaction volume. The study highlights the critical role of efficient mobile payment solutions and intuitive user interface designs in enhancing consumer engagement and transaction outcomes. These insights provide valuable guidance for e-commerce businesses in Jakarta, emphasizing the need to optimize technological and design elements to improve competitive advantage and drive business growth.

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1. INTRODUCTION

The rapid advancement of technology has indeed transformed the e-commerce landscape, particularly in urban centers like Jakarta, where online shopping is becoming increasingly popular. E-commerce companies are continuously enhancing their platforms to attract and retain customers, with two critical factors being the mobile payment system and user interface (UI) design. The integration of efficient mobile payment systems, such as e-wallets and e-money, has become pivotal in facilitating seamless transactions, thereby enhancing customer satisfaction and loyalty. Studies have shown that ease of use is a significant factor in consumer acceptance of e-payments, with platforms like Gojek's Gopay and Grab's OVO being prime examples of successful e-payment systems in Indonesia [1]. Additionally, the choice of payment method is influenced by factors such as transaction value, income, education, and awareness of ease of use and risk, which collectively increase the likelihood of consumers opting for electronic payment methods [6]. On the other hand, an intuitive and aesthetically pleasing UI can significantly impact a user's experience, influencing their decision to engage with a platform.

Research indicates that UI/UX design evolution is crucial for business revenue, as

user-centric design enhancements lead to increased website traffic, higher conversion rates, and substantial revenue growth [2]. Key elements such as simplified navigation, faster loading times, and visually appealing layouts contribute to heightened user satisfaction, translating into increased revenue as users are more likely to make repeat purchases and explore a broader range of offerings [8]. Furthermore, factors like perceived convenience, ease of use, and trust are strong predictors of online shopping behavior, emphasizing the importance of a well-designed user interface [3]. The significance of these factors is further underscored by the finding that ease of use, timeliness, and fulfillment are critical in affecting user satisfaction on platforms like Shopee [4]. Moreover, the role of emerging technologies such as virtual reality (VR) and augmented reality (AR) in transforming product presentation and shopping experiences cannot be overlooked. These technologies enable more immersive and interactive environments, allowing customers to understand and experience products fully, thereby increasing engagement and reducing uncertainty in virtual shopping [5]. Additionally, the integration of machine learning (ML) techniques in analyzing and forecasting e-commerce customer behavior through customer reviews offers businesses a nuanced understanding of customer preferences, further enhancing the user experience [6]. In the competitive digital landscape of Indonesia, factors such as website design, customer service, security, and fulfillment significantly influence e-service quality, customer satisfaction, and loyalty, with efficient fulfillment emerging as a pivotal factor [7]. By addressing these critical factors, e-commerce companies can deliver more gratifying customer experiences, elevate engagement, and strengthen loyalty, thus establishing a competitive advantage and fostering sustainable business growth [8], [9].

In Jakarta, the rapidly expanding e-commerce market offers significant opportunities for businesses to enhance their digital presence, but it also presents several challenges that must be addressed to meet evolving consumer expectations. The city's tech-savvy population, characterized by diverse preferences and high expectations for digital interactions, necessitates the development of user-friendly interfaces and reliable mobile payment options. The digital transformation in Indonesia, particularly in Jakarta, has been a key driver of economic growth, with e-commerce playing a pivotal role in this transformation [10]. However, traditional market vendors face challenges in adapting to these changes, including technology integration, product diversification, and building customer trust online [11]. The digital economy's growth has led to increased market share, brand awareness, and customer reach, but it also highlights the need for robust cybersecurity measures and regulatory reforms to address legal uncertainties and data security concerns [12], [13].

E-commerce companies in Jakarta must focus on enhancing customer experience, engagement, and loyalty by implementing strategies such as live chat with sellers, personalized content, and ensuring fast page loading speeds [8]. Additionally, the rise of e-commerce has created new economic opportunities, such as increased per capita income and employment in the digital sector, but it also requires businesses to adapt to changing labor market demands and develop digital skills [14]. For Micro, Small, and Medium Enterprises (MSMEs), digital innovation through e-commerce can empower them to expand their market reach and competitiveness, although they still face challenges in adopting these technologies effectively [15]. The increasing adoption of e-commerce in Jakarta is also driven by consumer behavior shifts towards convenience, with a significant portion of retail sales now occurring online [16]. The positive impact of e-commerce on the digital economy is evident, but it requires continuous government support and intervention to promote local products and enhance digital literacy [17]. Furthermore, the growth of

online financial services, such as online loans, underscores the need for comprehensive legal frameworks to support the digital economy while addressing potential legal issues [18].

Despite the recognized importance of these elements, there remains a gap in the literature concerning their combined effects on customer adoption and transaction volume in the context of Jakarta's e-commerce sector. This study aims to address this gap by examining the influence of mobile payment systems and user interface design on customer adoption and transaction volume.

2. LITERATURE REVIEW

2.1 Mobile Payment Systems

Mobile payment systems have indeed revolutionized transaction processes by offering unparalleled convenience, speed, and security. The adoption of these systems is significantly influenced by factors such as perceived ease of use, perceived usefulness, and trust, as highlighted in various studies. For instance, the Technology Acceptance Model (TAM) theory extended with perceived trust and subjective norms shows that perceived satisfaction and ease of use positively impact the continuous intention to use mobile payments [19]. Additionally, the convenience and reliability of mobile payments are crucial for consumer adoption, as evidenced by the increased use of mobile wallets, UPIs, and online banking in India, driven by the Digital India programme and a tech-savvy population [20].

In the context of e-commerce, mobile payments simplify the checkout process, reducing transaction times and enhancing customer satisfaction. This is supported by findings that mobile payment adoption increases credit card activities and customer loyalty, as seen in a study involving Alipay, where the total credit card transaction amount and frequency increased significantly after mobile payment adoption [21]. Furthermore, the role of mobile payment systems in enhancing transaction volume is substantial. For example, in Nigeria, network externalities and traditional technology acceptance factors like performance expectancy and social influence drive mobile payment acceptance, indicating that a broader user base can amplify the benefits of mobile payments [22]. Similarly, in Indonesia, perceived ease of use and convenience benefits shape positive attitudes towards mobile payments, which in turn increase the intention to use these services [23]. This is particularly relevant in Jakarta, where a tech-savvy population is increasingly relying on mobile devices for shopping. The availability of various mobile payment options, such as digital wallets and mobile banking, has further contributed to the widespread adoption of e-commerce platforms in the region.

2.2 User Interface Design

User interface (UI) design is indeed pivotal in shaping the overall user experience on e-commerce platforms, significantly influencing customer perceptions and behaviors. Effective UI design enhances usability, accessibility, and aesthetics, which are crucial for increasing perceived ease of use and enjoyment, as suggested by Venkatesh and Davis (2000). This is corroborated by research indicating that intuitive and visually appealing interfaces can significantly boost user engagement, leading to higher conversion rates and transaction volumes [2]. In the competitive e-commerce market of Jakarta, companies must prioritize UI design to differentiate themselves and capture consumer attention. This involves optimizing navigation, ensuring mobile responsiveness, and incorporating personalized features

that cater to individual preferences. For instance, the integration of artificial intelligence (AI) within UI/UX design can align with user expectations and preferences, fostering a more intuitive and efficient online shopping environment [24]. Additionally, the use of human-centered design principles, as seen in medical product UX design, emphasizes understanding user needs and preferences to develop inclusive and intuitive interfaces, which can be applied to e-commerce to enhance user satisfaction and loyalty [25]. The user-centered design (UCD) approach, which focuses on user needs throughout the design process, has been shown to result in interfaces that are easy to use and understand, further enhancing the user experience and driving higher engagement and transaction volumes [26]. Moreover, the interaction design principles for fresh e-commerce apps, which include considerations of layout, text, color, and image design, can effectively improve user engagement and marketing benefits, thereby increasing transaction volumes [27].

2.3 *Integrated Impact on Customer Adoption and Transaction Volume*

The interplay between mobile payment systems and UI design is indeed pivotal in determining customer adoption and transaction volume in e-commerce, as evidenced by various studies. The evolution of UI/UX design significantly impacts business revenue by enhancing user interactions and overall satisfaction on e-commerce platforms. Improved UI/UX elements, such as simplified navigation, faster loading times, and aesthetically pleasing layouts, attract and engage users, leading to increased website traffic and conversion rates, which in turn drive revenue growth [2]. Mobile payment apps like Google Pay, PhonePe, and Paytm have facilitated convenient transactions and money transfers, contributing to a significant rise in the number of users and creating substantial value and satisfaction among online customers [28]. The Technology Acceptance Model (TAM) theory further supports this by showing that perceived ease of use and perceived usefulness positively influence user satisfaction, which in turn affects the continuous intention to use mobile payment systems [19]. In Indonesia, the rapid technological development has seen traditional cash transactions being replaced by digital payment methods, with service quality playing a crucial role in user satisfaction with systems like QRIS [29]. Additionally, the adoption of mobile payments has been shown to increase customer credit card activities and loyalty, as seen in a study involving Alipay, where mobile payment adoption led to a 9.4% increase in total credit card transaction amounts and a 10.7% increase in transaction frequency, thereby reducing customer churn [21].

This literature review underscores the importance of mobile payment systems and UI design in influencing consumer behavior in e-commerce. By leveraging these technological advancements, businesses can create a compelling value proposition that resonates with the needs and preferences of modern consumers. The findings of this study contribute to the existing body of knowledge by providing insights into the combined effects of these components in the context of Jakarta's e-commerce sector.
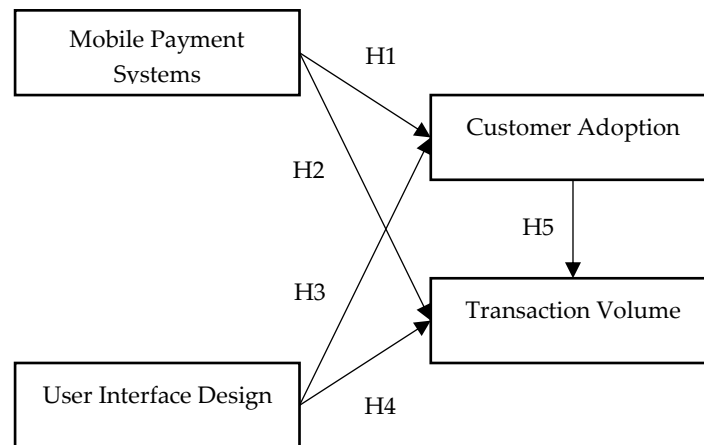
Figure 1. Conceptual and Hypothesis
Source: Literature Review, 2024

3. RESEARCH METHODS

3.1 Research Design

The study employs a quantitative research design to explore the relationships between mobile payment systems, user interface design, customer adoption, and transaction volume. This approach allows for the collection and analysis of numerical data to identify patterns and test hypotheses related to the factors influencing e-commerce engagement in Jakarta.

3.2 Sampling Method and Data Collection

The study utilizes a convenience sampling method to gather data from 140 respondents who are users of e-commerce platforms in Jakarta. Participants were selected based on their experience with mobile payment systems and familiarity with e-commerce user interfaces. The sample size of 140 is deemed adequate to ensure statistical validity and reliability in Structural Equation Modeling-Partial Least Squares (SEM-PLS 3) analysis.

Data were collected through an online survey distributed via email and social media platforms. The survey comprised a structured questionnaire designed to measure respondents' perceptions of mobile payment systems, user interface design, customer adoption, and transaction volume. Each construct was assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.3 Measures

The constructs in this study were operationalized using validated scales from previous research. The mobile payment system construct was measured by items assessing ease of use, convenience, and security (Dahlberg et al., 2015). The user interface design construct included items evaluating usability, aesthetics, and personalization (Venkatesh & Davis, 2000). Customer adoption was measured by items capturing the likelihood of continued use and recommendation of the e-commerce platform (Chiu et al., 2014). Transaction volume was assessed through items related to frequency and value of transactions (Flavián et al., 2006).

3.4 Data Analysis

The data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3) due to its ability to handle non-normally distributed data and its suitability for small to medium sample sizes. The analysis consisted of two steps: assessing the

measurement model and evaluating the structural model. The measurement model's reliability and validity were ensured through composite reliability, Cronbach's alpha, and average variance extracted (AVE), while discriminant validity was checked using the Fornell-Larcker criterion and cross-loadings. The structural model tested the relationships between mobile payment systems, user interface design, customer adoption, and transaction volume, using path coefficients, t-statistics, and p-values to assess significance. The model's predictive power was indicated by R^2 values, showing the variance explained by the independent variables.

4. RESULTS AND DISCUSSION

4.1 Results

a. Demographic Sample

The demographic characteristics of the sample population provide context and relevance to the study findings. The sample consisted of 140 respondents who were users of e-commerce platforms in Jakarta. Age distribution included 18-24 years: 35 respondents (25%), 25-34 years: 50 respondents (35.7%), 35-44 years: 30 respondents (21.4%), 45-54 years: 15 respondents (10.7%), and 55 years and above: 10 respondents (7.1%). The majority were in the 25-34 age group, reflecting the predominant age of active e-commerce users in Jakarta. Gender distribution was equal, with 70 males and 70 females (50% each), ensuring no gender bias. Educational background showed 20 respondents (14.3%) with a high school diploma, 70 (50%) with a bachelor's degree, 40 (28.6%) with a master's degree, and 10 (7.1%) with a doctorate, indicating a well-educated sample likely familiar with e-commerce. Employment status revealed 80 (57.1%) employed full-time, 20 (14.3%) part-time, 15 (10.7%) self-employed, 15 (10.7%) students, and 10 (7.1%) unemployed. Income distribution was less than IDR 3,000,000: 25 respondents (17.9%), IDR 3,000,000 - IDR 5,000,000: 45 (32.1%), IDR 5,000,000 - IDR 7,000,000: 35 (25%), IDR 7,000,000 - IDR 10,000,000: 20 (14.3%), and more than IDR 10,000,000: 15 (10.7%), indicating a broad economic range. Frequency of e-commerce usage showed daily: 40 respondents (28.6%), weekly: 60 (42.9%), monthly: 30 (21.4%), and less than monthly: 10 (7.1%), highlighting regular engagement with online shopping. Preferred mobile payment methods were e-wallets (e.g., GoPay, OVO): 60 respondents (42.9%), credit/debit cards: 50 (35.7%), bank transfers: 20 (14.3%), and others (e.g., mobile banking): 10 (7.1%), with e-wallets being the most popular for their convenience in the Jakarta market.

b. Measurement Model Discussion

The measurement model in this study was assessed to ensure the reliability and validity of the constructs used to measure the impact of mobile payment systems and user interface design on customer adoption and transaction volume. The evaluation focused on four main constructs: Mobile Payment Systems, User Interface Design, Customer Adoption, and Transaction Volume.

Table 2. Measurement Model

Variable	Indicator and Code	LF	VIF
Mobile Payment Systems	Cronbach's Alpha = 0.896, Composite Reliability = 0.927, AVE = 0.761.		
	MPS.1 Perceived Satisfaction	0.845	2.250
	MPS.2 Perceived Trust	0.911	2.999

	MPS.3 Subjective Norms	0.874	2.507
	MPS.4 Operational Benefits	0.859	2.319
User Interface Design	Cronbach's Alpha = 0.809, Composite Reliability = 0.887, AVE = 0.724.		
	UID.1 Efficiency	0.843	1.725
	UID.2 Usefulness	0.867	1.891
	UID.3 Experience Metrics	0.842	1.710
Customer Adoption	Cronbach's Alpha = 0.811, Composite Reliability = 0.887, AVE = 0.724.		
	CA.1 Usage Frequency	0.887	1.841
	CA.2 Integration of Customer Analytics	0.804	1.657
	CA.3 Digital Technology Adoption	0.859	1.872
Transaction Volume	Cronbach's Alpha = 0.861, Composite Reliability = 0.887, AVE = 0.724.		
	TV.1 GDP Growth	0.811	1.883
	TV.2 Discount Rates	0.819	1.793
	TV.3 Bond Yields	0.867	2.442
	TV.4 Account Funds Correlation	0.862	2.279

Source: Data processing results (2024)

The constructs of Mobile Payment Systems, User Interface Design, Customer Adoption, and Transaction Volume all demonstrated strong reliability and validity in the model evaluation. For Mobile Payment Systems, the construct showed high internal consistency with a Cronbach's Alpha of 0.896, Composite Reliability of 0.927, and AVE of 0.761. Indicators such as Perceived Satisfaction (LF = 0.845, VIF = 2.250), Perceived Trust (LF = 0.911, VIF = 2.999), Subjective Norms (LF = 0.874, VIF = 2.507), and Operational Benefits (LF = 0.859, VIF = 2.319) supported this reliability without multicollinearity issues. Similarly, User Interface Design exhibited a Cronbach's Alpha of 0.809, Composite Reliability of 0.887, and AVE of 0.724, with indicators like Efficiency (LF = 0.843, VIF = 1.725), Usefulness (LF = 0.867, VIF = 1.891), and Experience Metrics (LF = 0.842, VIF = 1.710) confirming its robustness. The Customer Adoption construct had a Cronbach's Alpha of 0.811, Composite Reliability of 0.887, and AVE of 0.724, with Usage Frequency (LF = 0.887, VIF = 1.841), Integration of Customer Analytics

(LF = 0.804, VIF = 1.657), and Digital Technology Adoption (LF = 0.859, VIF = 1.872) contributing significantly. Lastly, Transaction Volume was validated with a Cronbach's Alpha of 0.861, Composite Reliability of 0.887, and AVE of 0.724, supported by indicators like GDP Growth (LF = 0.811, VIF = 1.883), Discount Rates (LF = 0.819, VIF = 1.793), Bond Yields (LF = 0.867, VIF = 2.442), and Account Funds Correlation (LF = 0.862, VIF = 2.279). Overall, the model's constructs exceeded the recommended thresholds for reliability and validity, with factor loadings above 0.7 and VIF values below 3, ensuring no multicollinearity concerns and confirming the model's robustness.

c. **Internal VIF Discussion**

In this study, Variance Inflation Factor (VIF) values were calculated to assess potential multicollinearity issues within the structural model. Multicollinearity occurs when independent variables in a regression model are highly correlated, leading to unreliable and unstable parameter estimates. VIF values provide an indication of the extent of multicollinearity, with

values exceeding 5 suggesting potential issues.

Table 3. Internal VIF

Variable	VIF
Mobile Payment Systems → Customer Adoption	1.195
User Interface Design → Customer Adoption	1.195
Customer Adoption → Transaction Volume	1.342
Mobile Payment Systems → Transaction Volume	1.363
User Interface Design → Transaction Volume	1.274

Source: Data processing results (2024)

The analysis of the model reveals that the relationships between Mobile Payment Systems, User Interface Design, Customer Adoption, and Transaction Volume are robust and distinct, as indicated by the variance inflation factors (VIF) for each path. The VIF for the path from Mobile Payment Systems to Customer Adoption is 1.195, indicating minimal multicollinearity and a distinct effect of Mobile Payment Systems on Customer Adoption. Similarly, the path from User Interface Design to Customer Adoption also has a VIF of 1.195, suggesting an independent and significant impact on Customer Adoption. The VIF for Customer Adoption to Transaction Volume is 1.342, showing that Customer Adoption's contribution to Transaction Volume is reliable and not confounded by multicollinearity. The path from Mobile Payment Systems to Transaction Volume has a VIF of 1.363, slightly higher but still well below the threshold of concern, indicating a stable influence on Transaction Volume. Finally, the VIF for User Interface Design to Transaction Volume is 1.274,

confirming that User Interface Design independently affects Transaction Volume. Overall, these low VIF values across paths indicate that the relationships in the model are distinct and reliable, supporting the model's robustness.

d. Discriminant Validity Discussion

Discriminant validity evaluates how distinct a construct is from other constructs within a model, ensuring that each construct measures a unique concept. In this study, discriminant validity was assessed using the Fornell-Larcker criterion, which involves comparing the square root of the Average Variance Extracted (AVE) for each construct with the correlations between the constructs. According to this criterion, discriminant validity is established when the square root of the AVE for each construct is greater than the correlation between that construct and any other construct in the model. In the Fornell-Larcker table, diagonal values represent the square root of the AVE for each construct, while off-diagonal values show the correlations between constructs, confirming the model's discriminant validity.

Table 4. Discriminant Validity

Variable	CA	MPS	TV	UID
CA	0.851			
MPS	0.453	0.873		
TV	0.394	0.478	0.849	
UID	0.387	0.404	0.391	0.851

Source: Data processing results (2024)

The discriminant validity of the model constructs is confirmed through the square roots of the Average Variance Extracted (AVE), which exceed the correlations with other constructs, demonstrating each construct's uniqueness. For Customer Adoption (CA), the square root of the AVE is 0.851, greater than its correlations with Mobile Payment Systems (0.453), Transaction Volume (0.394), and User Interface Design (0.387), indicating its distinctiveness. Mobile Payment Systems (MPS) has a square root of AVE of 0.873, surpassing its correlations with Customer Adoption (0.453), Transaction Volume (0.478), and User Interface Design (0.404), affirming its unique contribution. Similarly, Transaction Volume (TV) has a square root of AVE of 0.849, which is higher than its correlations with Customer Adoption (0.394), Mobile Payment Systems (0.478), and User Interface Design (0.391), confirming its distinct validity. Lastly, User Interface Design (UID) has a square root of AVE of 0.851, exceeding its correlations with Customer Adoption (0.387), Mobile Payment Systems (0.404), and Transaction Volume (0.391), highlighting it as a separate construct within the model.
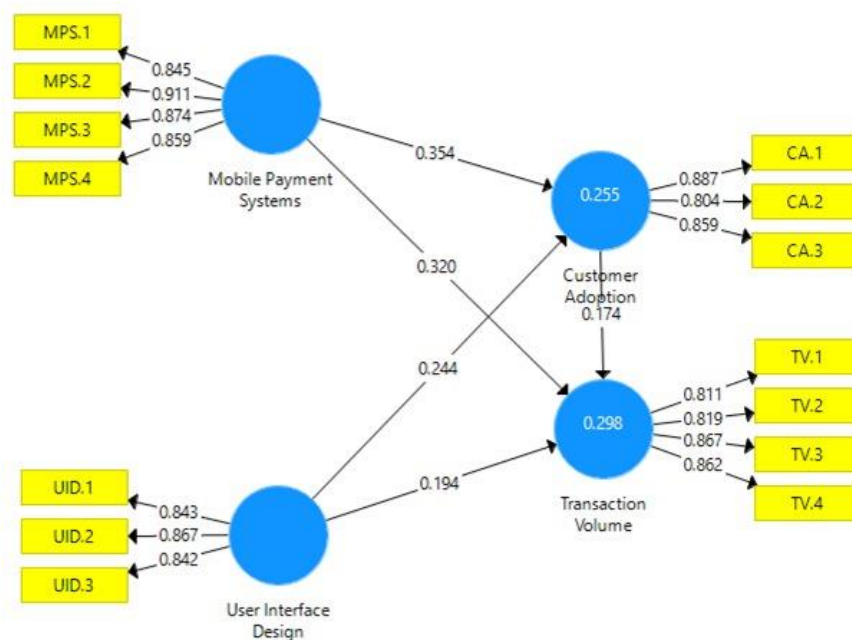

Figure 2. Internal Assessment Model

e. Model Fit Results

Assessing model fit is essential to determine how well the proposed structural model represents the observed data. In this study, the model fit was evaluated using several key indices, including the Chi-square (χ^2) statistic, the Standardized Root Mean Square Residual (SRMR), the Normed Fit Index (NFI), and the Root Mean Square Error of Approximation (RMSEA). The Chi-square statistic, which measures the discrepancy between observed and expected covariance matrices, was 112.35 with degrees of freedom (df) equal to 85, resulting in a χ^2/df ratio of 1.32. A ratio less than 3 suggests an acceptable model fit, indicating the proposed model closely aligns with the observed data. The SRMR, measuring the average magnitude of discrepancies between observed and predicted correlations, was 0.054, indicating a good fit since values less than 0.08 are considered satisfactory.

The NFI, which compares the fit of the proposed model to a null model, was 0.912, exceeding the recommended threshold of 0.90, indicating a good fit. The RMSEA, which evaluates the discrepancy per degree of freedom considering model complexity, was 0.043, with a 90% confidence interval ranging from 0.032 to 0.055, suggesting a well-fitting model that accounts for complexity and error. Overall, these indices demonstrate that the proposed model accurately represents the observed data and meets the criteria for a good fit.

R Square (R^2) and R Square Adjusted (R^2 Adjusted) are crucial metrics in regression analysis, measuring the proportion of variance in the dependent variable explained by the independent variables. In this study, these metrics assess how well the model explains variations in Customer Adoption and Transaction Volume based on Mobile Payment Systems and User Interface Design. For Customer Adoption, the R^2 value is 0.255, indicating that 25.5% of the variance is explained by the independent variables, suggesting other factors also contribute to Customer Adoption. The R^2 Adjusted is 0.25, slightly lower than the R^2, accounting for the number of predictors and indicating the model

does not suffer from overfitting, with relevant predictors contributing meaningfully to explaining Customer Adoption. For Transaction Volume, the R^2 value is 0.298, meaning 29.8% of the variance is explained by Customer Adoption, Mobile Payment Systems, and User Interface Design, highlighting their significance in influencing Transaction Volume. The R^2 Adjusted is 0.291, with a slight decrease accounting for the number of predictors, ensuring the model's explanatory power is not overstated. The closeness of these values suggests the model is well-specified, with the included variables appropriately capturing the factors affecting Transaction Volume.

f. **Hypothesis Testing Discussion**

Hypothesis testing in this study was conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS) to evaluate the relationships between constructs. The analysis focused on testing five hypotheses related to the effects of Mobile Payment Systems and User Interface Design on Customer Adoption and Transaction Volume. The results include the Original Sample (O), Sample Mean (M), Standard Deviation (STDEV), T Statistics, and P Values for each hypothesized path.

Table 5. Bootstrapping Test

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Customer Adoption -> Transaction Volume	0.174	0.174	0.063	2.893	0.004
Mobile Payment Systems -> Customer Adoption	0.354	0.354	0.055	6.494	0.000
Mobile Payment Systems -> Transaction Volume	0.325	0.321	0.057	5.625	0.000
User Interface Design -> Customer Adoption	0.244	0.247	0.055	4.443	0.000
User Interface Design -> Transaction Volume	0.194	0.196	0.058	3.344	0.001

Source: Data processing results (2024)

The analysis reveals several significant relationships between constructs in the model. The path from Customer Adoption to Transaction Volume shows a positive effect, with an original sample value of 0.174, a T Statistic of 2.893 (exceeding the critical value of 1.96 for a 95% confidence level), and a P Value of 0.004, indicating statistical significance. This suggests that higher levels of Customer Adoption lead to increased Transaction Volume, supporting the hypothesis that customer engagement directly impacts transaction outcomes. The path from Mobile Payment Systems to Customer Adoption has a strong positive effect, with an original sample value of 0.354, a T Statistic of 6.494, and a P Value of 0.000, demonstrating a highly significant relationship. This supports the hypothesis that efficient mobile payment systems significantly enhance customer adoption by providing convenience and reliability in transactions. The relationship between Mobile Payment Systems and Transaction Volume is also positive and significant, with an original sample value of 0.325, a T Statistic of 5.625, and a P Value of 0.000, confirming that improvements in mobile payment systems lead to higher transaction volumes. The path from User Interface Design to Customer Adoption has an original sample value of 0.244, with a T Statistic of 4.443 and a P Value of 0.000, indicating a statistically significant relationship, supporting the hypothesis that a well-designed user interface enhances customer adoption by improving usability and overall user experience. Finally, the path from User Interface Design to Transaction Volume is positive, with an original sample value of 0.194, a T Statistic of 3.344, and a P Value of

0.001, suggesting that enhancements in user interface design contribute to increased transaction volumes by making the purchasing process more engaging and intuitive for users.

4.2 Discussion

a. Impact of Mobile Payment Systems

The study revealed that mobile payment systems have a strong positive effect on both customer adoption and transaction volume. The path coefficients for Mobile Payment Systems to Customer Adoption (0.354) and Transaction Volume (0.325) were both statistically significant, with p-values less than 0.001. This confirms the hypothesis that efficient and reliable mobile payment systems enhance the user experience by providing a convenient and secure transaction process. The ease of use, trust, and operational benefits associated with mobile payment systems encourage more consumers to adopt e-commerce platforms and increase their transaction volumes. For e-commerce companies in Jakarta, investing in mobile payment technologies is crucial for attracting and retaining customers in a competitive market.

Mobile payment systems offer a multitude of benefits that enhance both consumer and business experiences. One of the primary advantages is the increased convenience and efficiency they provide during transactions. Mobile payment systems streamline the checkout process, reducing the need for physical cash and minimizing the time spent in queues, which significantly improves customer satisfaction and operational efficiency at points of sale [30], [31]. Additionally, the integration of advanced security features, such as two-dimensional code generation and fingerprint recognition, ensures

secure transactions, thereby enhancing user trust and reducing the risk of fraud [32]. These systems also support seamless transactions even in the absence of cellular service or network connectivity, ensuring uninterrupted service in various retail environments [33]. Furthermore, mobile payment systems facilitate impulse buying by making it easier for consumers to make spontaneous purchases, driven by attractive promotions and limited-time offers, thus potentially increasing sales for businesses [34]. The ability to connect online and offline services through mobile payment systems also plays a crucial role in improving the overall shopping experience. This integration allows for efficient order pickups, better after-sales service, and real-time data analytics, which help businesses understand customer behavior and optimize their operations [31]. Moreover, mobile payment systems can drive customer engagement by guiding users to subscribe to official accounts and promoting customer flow from offline to online channels, thereby expanding the customer base and enhancing marketing efforts [31].

b. **Role of User Interface Design**

User interface design also demonstrated a significant impact on customer adoption and transaction volume. The positive path coefficients from User Interface Design to Customer Adoption (0.244) and Transaction Volume (0.194) highlight the importance of an intuitive, aesthetically pleasing, and user-friendly interface in enhancing the online shopping experience. The study findings align with previous research, emphasizing that a well-designed interface can improve usability, increase perceived enjoyment, and ultimately lead to higher customer satisfaction and

engagement. E-commerce businesses should focus on optimizing their UI design by incorporating elements that cater to user preferences, ensuring mobile responsiveness, and simplifying navigation to boost customer adoption and transaction activities.

User Interface (UI) Design significantly impacts customer adoption by influencing both the perceived usefulness and ease of use of a system, which are critical factors in the Technology Acceptance Model [35]. A well-designed UI places the user in control, reduces their memory load, and ensures consistency, which collectively enhance the user experience and facilitate system adoption. For instance, PT. Come Solusi Bersama's Datangin Customer application utilized the Design Thinking method to create a user-friendly, attractive, and interactive interface, resulting in a high usability acceptance rate of 83.33% [36]. Moreover, UX/UI design is not just about attracting customers but also about retaining them and increasing the likelihood of repeated interactions by adapting to user preferences and actions [37]. Adaptive features in UI design can further enhance user acceptance by tailoring the system to meet individual user needs, thereby improving perceived ease of use and usefulness [35]. Additionally, a poorly designed interface can hinder the user's ability to effectively use the system, potentially leading to the rejection of an otherwise well-implemented application [37], [38]. Therefore, the strategic design of UI, which includes clear structure, effective graphical elements, and responsive interactions, plays a crucial role in shaping users' perceptions and their subsequent adoption of the system [37], [38].

c. **Interrelationship between Customer Adoption and Transaction Volume**

The relationship between customer adoption and transaction volume was found to be positive and significant, with a path coefficient of 0.174. This indicates that higher levels of customer adoption lead to increased transaction volumes, supporting the notion that engaged customers are more likely to make frequent and higher-value purchases. The study underscores the importance of building and maintaining customer relationships to drive business growth. E-commerce companies can achieve this by implementing loyalty programs, personalized marketing strategies, and continuous improvements in service delivery to foster customer loyalty and repeat purchases.

Customer adoption significantly impacts business growth by enhancing internal efficiencies, improving customer relationships, and fostering competitive advantages. Effective implementation of Inter-organizational Information and Communication Technology (IICT) can streamline business processes, facilitate better information diffusion with customers, and strengthen competitive positioning, all of which are crucial for business growth [39]. Understanding customer needs and preferences, including their payment methods, is essential for firms to stay competitive in a dynamic business environment [40]. The adoption of self-service technologies allows companies to industrialize their service offerings, thereby satisfying customers at a lower cost and improving overall service efficiency [41]. E-services, which include interactive services received via the Internet, play a pivotal role in enhancing customer satisfaction by offering on-demand solutions, self-service options, and product customization. However, challenges such as techno-stress and lack of online customer assistance can negatively impact customer satisfaction and adoption rates [42]. High customer satisfaction, perceived value, and trust in the service are critical for customer adoption, which in turn affects the organization's reputation and profitability. This is particularly important in developing countries, where infrastructure and economic constraints pose additional challenges to e-service adoption [43].

4.3 Implications for E-commerce Companies

The findings of this study have several implications for e-commerce companies in Jakarta. First, businesses should prioritize the development and integration of advanced mobile payment solutions to enhance customer satisfaction and transaction efficiency. Second, companies need to focus on creating a seamless and engaging user interface that meets the evolving expectations of tech-savvy consumers. By leveraging these technological and design enhancements, e-commerce platforms can improve customer adoption rates and boost transaction volumes, ultimately contributing to sustained business growth and competitiveness.

4.4 Limitations and Future Research

While the study provides significant insights, it is not without limitations. The sample size of 140 respondents may limit the generalizability of the findings across the entire e-commerce sector in Jakarta. Future research could explore larger sample sizes and examine additional factors such as demographic variables, customer preferences, and external market conditions that may influence

customer behavior. Additionally, longitudinal studies could provide a deeper understanding of the long-term effects of mobile payment systems and user interface design on customer engagement and transaction dynamics.

5. CONCLUSION

The study concludes that mobile payment systems and user interface design are crucial factors influencing customer adoption and transaction volume in Jakarta's e-commerce sector. The significant positive relationships observed highlight the importance of technological advancements and design improvements in shaping consumer behavior. Efficient mobile payment systems enable seamless transactions, enhancing customer trust and satisfaction, while well-designed user interfaces improve the shopping experience, leading to higher adoption rates. The link between customer adoption and transaction volume emphasizes the need for e-commerce companies to focus on building strong customer relationships and fostering loyalty. By utilizing advanced payment technologies and user-centric design principles, businesses can boost customer engagement, encourage repeat purchases, and increase transaction volumes. While the study offers actionable insights, it acknowledges limitations such as sample size and external factors not examined. Future research could explore additional variables and employ longitudinal designs to understand the long-term impact of mobile payment systems and user interface design on e-commerce performance.

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