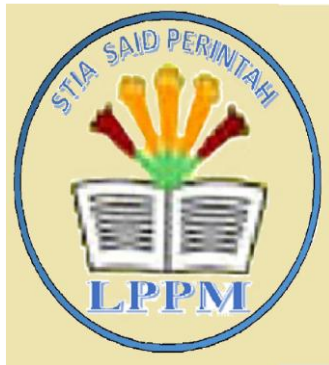

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The Role of Customer Satisfaction in Mediating E-Service Quality, Customer Engagement on Customer Loyalty

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Abstract

This study examines the influence of e-service quality and customer engagement on customer loyalty, with customer satisfaction as a mediating variable among DANA digital wallet users. Using a quantitative approach, data were collected from 150 university students in Kediri through Likert scale-based questionnaires and analyzed using SEM-PLS. The findings reveal that e-service quality and customer engagement positively and significantly affect customer satisfaction and customer loyalty. Customer satisfaction also has a significant positive effect on loyalty and successfully mediates the relationships between e-service quality, customer engagement, and customer loyalty. These results indicate that improving service quality and strengthening user engagement can enhance customer satisfaction and ultimately increase customer loyalty in digital wallet services.

Keywords: E-Service Quality, Customer Engagement, Customer Satisfaction, Customer Loyalty, Digital Wallet, DANA

Introduction

Digital technological advancement has significantly transformed economic activities, particularly in payment systems. This transformation has shifted transaction patterns from cash-based payments to cashless systems, which are widely perceived as more practical and efficient. The increasing number of internet users has also become a major driver of the expansion of financial technology (fintech) services. Along with the rapid development of information technology, fintech services continue to evolve and provide broader public access to financial services (Cambridge Centre for Alternative Finance & ADB FinTechSpace Institute, 2019).

One of the fintech innovations experiencing substantial growth is the digital wallet, commonly referred to as an e-wallet. This service offers a variety of features that enable users to conduct transactions conveniently, including fund transfers, bill payments, product purchases, and instant balance top-ups. The adoption of e-wallets continues to increase in response to public demand for practical and accessible financial services. Digital wallets have become an integral part of everyday life, particularly among younger generations who exhibit high levels of technological adoption. The Indonesia Fintech Trends Survey revealed that 96% of respondents had used e-wallet services (Reynaldy, 2024), indicating the high penetration of digital wallets in Indonesia. Competition among e-wallet providers in Indonesia is also highly competitive, with GoPay, DANA, OVO, and ShopeePay emerging as major platforms competing for consumer preference.

The availability of various digital wallet services provides users with alternatives that align with their needs and preferences. Consequently, each provider is required to consistently deliver high-quality services to maintain user loyalty. Customer loyalty is a crucial factor in ensuring business sustainability because loyal customers contribute to long-term business growth and stability. In the long term, loyalty encourages repeated usage and strengthens users' attachment to a particular brand or service (Dam & Dam, 2021).

Kediri, as one of Indonesia's educational centers, has a large population of active digital users. The city is home to numerous universities that attract students from various regions. As part of the younger generation, university students demonstrate high levels of technology adoption, including the use of digital wallets. Among the available platforms, the DANA application is widely used by students because it is considered suitable for their

daily transaction needs. This condition makes university students in Kediri a relevant population for examining digital wallet usage behavior, particularly in relation to customer loyalty. Nevertheless, preliminary observations suggest that a high level of e-wallet usage does not necessarily indicate strong loyalty toward a specific application. Users may switch to competing platforms when they perceive alternative services as more beneficial or capable of providing a superior user experience.

According to Sudari et al., (2019), customer loyalty is reflected in repeated usage behavior and positive attitudes toward a company. One of the main factors influencing customer satisfaction and loyalty is electronic service quality, commonly referred to as e-service quality. E-service quality reflects the extent to which a digital service can fulfill customer expectations and needs. Parasuraman et al., (2005) identified efficiency, fulfillment, system availability, and privacy as the primary dimensions of e-service quality. Positive user experiences generated through superior service quality can significantly enhance customer satisfaction.

Customer engagement, as defined by Brodie et al., (2013), refers to the level of consumer involvement encompassing behavioral, emotional, and cognitive dimensions toward a service. It represents the way consumers interact with the services they use. According to Sudirman and Patwayati, (2021), customer interaction can strengthen the relationship between customers and businesses. Higher levels of customer engagement encourage users to continue using a service and to express positive opinions about the company. Meanwhile, customer satisfaction is defined as the outcome of comparing service performance with customer expectations (Vasić et al., 2019). Satisfaction increases when customer experiences meet or exceed expectations and decreases when those expectations are not fulfilled.

Customer satisfaction plays a significant role in shaping customer loyalty because satisfied consumers are more likely to remain committed to the same service provider. Sudari et al., (2019) further emphasized that loyalty is reflected in frequent service usage and the willingness to recommend the service to others. Similarly, loyalty develops over time and is influenced by several factors, including customer engagement and service quality. Both customer engagement and e-service quality affect customer satisfaction, which subsequently influences customer loyalty. For instance, Vicramaditya, (2021) found

that e-service quality significantly affects customer satisfaction, which in turn influences customer loyalty. Likewise, Fauziyah et al., (2023) reported that customer loyalty is influenced by both customer satisfaction and customer engagement.

However, inconsistencies in previous research findings indicate the need for further investigation into how e-service quality and customer engagement simultaneously influence customer loyalty through customer satisfaction as a mediating variable. Most previous studies have only examined specific relationships between two or three constructs or have analyzed these variables separately. In addition, studies focusing on DANA users among university students in Kediri City remain limited. This condition highlights the existence of a research gap that warrants further exploration. Only a limited number of empirical studies have simultaneously integrated customer engagement and e-service quality within the context of digital wallet services while positioning customer satisfaction as a mediating variable affecting customer loyalty.

By developing a comprehensive model that examines both direct and indirect relationships among e-service quality, customer engagement, customer satisfaction, and customer loyalty, this study seeks to address the identified research gap. The novelty of this research lies in its focus on providing empirical evidence from a specific population of active digital financial service users, namely university students who use the DANA digital wallet. Accordingly, the significance of this study is reflected in the managerial need to understand effective strategies for strengthening loyalty among students as active e-wallet users. Through a comprehensive examination of the relationships among these variables, this study is expected to provide strategic recommendations for DANA management in enhancing customer satisfaction, strengthening customer engagement, and maintaining customer loyalty within the student segment. Furthermore, this study aims to generate valuable insights into the factors that most effectively contribute to customer loyalty and long-term business sustainability

Theoretical Framework and Hypothesis Development

E-Service Quality

E-service quality refers to the ability of electronic-based services to effectively and efficiently facilitate transactions through internet networks (Santos, 2003). Compared to

conventional services, electronic services possess distinctive characteristics because interactions are conducted through digital systems. The quality of an e-service reflects the extent to which the service is able to meet user expectations regarding convenience, transaction speed, and security. Kotler, (2012) stated that service quality is closely related to a company's ability to fulfill customer expectations.

Parasuraman et al., (2005) developed the E-S-QUAL model to identify the main dimensions of e-service quality, namely efficiency, fulfillment, system availability, and privacy. Efficiency refers to the ease and speed with which users can access and utilize a service. Fulfillment relates to the ability of the service provider to deliver services in accordance with promises and user expectations. System availability reflects the consistency and reliability of the system in operating properly without disruption. Meanwhile, privacy concerns the protection and security of users' personal data and information. These four dimensions are commonly used to evaluate users' perceptions of the quality of electronic services they receive.

Customer Engagement

According to Brodie et al., (2013), customer engagement refers to the level of consumer involvement that encompasses behavioral, emotional, and cognitive dimensions toward a service or brand. It reflects the ongoing interaction between consumers and the services they use. Bowden (2009) further explained that customer engagement is a response shaped by a combination of emotional and rational factors that encourage users to maintain a relationship with a company.

Research conducted by Sudirman and Patwayati, (2021) demonstrated that customer interaction can strengthen the relationship between consumers and businesses. Customer engagement is reflected through indicators such as enthusiasm, attention, deep involvement, interactivity, and consumer identification with a particular service. A stronger relationship between customers and the company indicates a higher level of customer engagement.

Customer Satisfaction

Customer satisfaction is defined as the outcome of consumers comparing the performance of a service with their expectations (Vasić et al., 2019). A customer's level of

satisfaction is closely associated with their experience while using the service. According to Setiawan et al., (2020), customer satisfaction represents both emotional and cognitive responses arising from service consumption experiences over a certain period of time.

Customer satisfaction also plays an important mediating role in the relationship between customer engagement, service quality, and customer loyalty. Higher levels of customer satisfaction increase the likelihood that customers will continue using the service and remain loyal to the provider.

Customer Loyalty

Customer loyalty refers to a consumer's commitment to consistently use a particular service over time (Sudari et al., 2019). Loyalty is reflected through repeated usage behavior, the intention to continue using the service, and the willingness to recommend it to others. In the context of digital services, where competition among providers is increasingly intense, customer loyalty plays a crucial role in sustaining service usage and maintaining long-term business success.

Customer loyalty does not emerge instantly but develops gradually through various influencing factors, including customer engagement and service quality. Customers' perceptions of their experiences while using a service strongly influence their decision to continue using it. Positive experiences are more likely to strengthen customer attachment and encourage long-term loyalty toward the service provider.

The Relationship Between E-Service Quality, Customer Engagement, Customer Satisfaction, and Customer Loyalty

E-service quality relates to the ability of electronic-based services to deliver experiences that align with user expectations. High-quality services provide convenience, speed, and security in transactions, thereby encouraging users to continue utilizing the service. Positive experiences perceived during service usage influence users' decisions to engage in repeated usage. Customer loyalty is positively and significantly impacted by e-service quality, according to a research by Silviana dan Puspaningrnm (2022). These results suggest that higher levels of customer loyalty are associated with improved electronic service quality.

H1: "E-Service Quality has a significant effect on Customer Loyalty".

Customer engagement reflects the level of customer involvement with a service, including interaction, attention, and emotional attachment. Customers' relationships with the services they use are strengthened by increasing levels of involvement. Long-term connections motivate clients to keep utilizing the service. According to Harimurti and Suryani (2019), client involvement has a positive and significant impact on customer loyalty. These results imply that greater customer loyalty is correlated with more involvement.

H2: "Customer Engagement has a significant effect on Customer Loyalty".

Customer happiness is impacted by e-service quality since it is evaluated based on user expectations. Services that offer security, speed, and ease of access enhance the user experience. When experiences live up to expectations, customer happiness increases. Noor's study indicates that e-service quality has a substantial influence on customer satisfaction (2022). This implies that higher service quality and increased customer satisfaction are associated.

H3: "E-Service Quality has a significant effect on Customer Satisfaction".

Through interactions between consumers and the service, customer engagement influences customer satisfaction. Increased involvement influences satisfaction levels by improving the whole service experience. Positive experiences are typically experienced by customers who are actively involved. Customer involvement has a substantial impact on customer satisfaction, according to research by Harimurti & Suryani (2019), suggesting that engagement influences perceived contentment.

H4: "Customer Engagement has a significant effect on Customer Satisfaction".

The degree of pleasure felt after utilizing a service is known as customer satisfaction. Customers who are happy with a service are more likely to continue with it and use it again. One of the main elements affecting loyalty is satisfaction. According to Septiani's (2020) research, customer satisfaction has an impact on customer loyalty, with higher satisfaction levels resulting in higher levels of loyalty.

H5: "Customer Satisfaction has a significant effect on Customer Loyalty".

Customer loyalty and e-service quality are mediated by customer satisfaction. Customer happiness rises with good customer service, and loyalty rises as a result. This indirect link suggests that the impact of service quality on loyalty is reinforced by

satisfaction. Septiani (2020) provides examples of how customer happiness and e-service excellence affect customer loyalty.

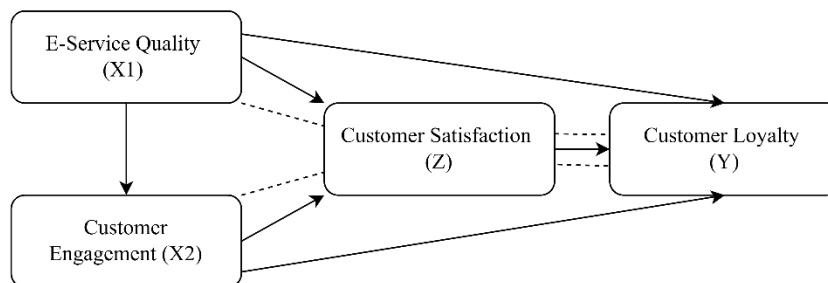
H6: "The relationship between E-Service Quality and Customer Loyalty is mediated by customer satisfaction".

Through customer pleasure, consumer participation also has an indirect impact on customer loyalty. Increased involvement enhances user happiness by improving the user experience. Customer loyalty develops as a result of this contentment. Chodriyah et al. (2023) show how customer pleasure and engagement affect customer loyalty.

H7: "Customer Satisfaction mediates the effect of Customer Engagement on Customer Loyalty".

The suggested research model is shown in Figure 1 based on the hypothesis formation.

Research Method



Method

This study employed a quantitative approach to examine the relationships among e-service quality, customer engagement, customer satisfaction, and customer loyalty. A quantitative method was selected because the primary objective of the research is to measure the relationships among variables through statistical analysis of numerical data. The study is explanatory in nature, as it seeks to explain the relationships among variables based on the proposed hypotheses.

The population of this study consists of university students in Kediri who use the DANA digital wallet application. Students were selected as the target population because

they actively engage in non-cash transactions and demonstrate a high level of digital service utilization. The sample consisted of 150 student respondents who actively use the DANA application. This sample size is considered sufficient to fulfill the analytical requirements of Structural Equation Modeling–Partial Least Squares (SEM-PLS). Respondents were required to be active users of the DANA application for transactional purposes. The sampling technique applied in this study was purposive sampling.

Primary data were collected through the distribution of questionnaires. The research instrument employed a Likert scale to measure respondents' perceptions of each variable. The Likert scale was used to systematically capture respondents' attitudes, perceptions, and opinions regarding the research variables. To ensure accurate measurement of the research constructs, the questionnaire items were developed based on indicators representing each variable.

The variables in this study were measured using indicators adopted from previous studies. Each variable was operationalized according to dimensions and characteristics relevant to the objectives of the research. The operational definitions of each variable are presented in the following table.

Operational Definition

Operational Definition	Indicators	Source	Variable
E-Service Quality (X1)	The capability of electronic-based services to facilitate transactions effectively and efficiently	Efficiency, Fulfilment, System Availability, Privacy	Parasuraman et al. (2005)
Customer Engagement (X2)	The level of customer involvement encompassing cognitive, emotional, and behavioural aspects toward a service	Enthusiasm, Attention, Absorption, Interaction, Identification	Zaid & Patwayati (2021)
Customer Satisfaction (Z)	The customer's response after comparing service performance with expectations	Overall satisfaction, Expectation confirmation	Khairawati (2019)
Customer Loyalty (Y)	The customer's commitment to continuously use a service over time	Repeat Purchase, Retention, Referrals	Pranitasari et al. (2022)

The data were analyzed using Structural Equation Modeling–Partial Least Squares

(SEM-PLS) with the assistance of the SmartPLS 4 software. This analytical method was employed to test the research hypotheses and examine the relationships among the study variables. The analysis process consisted of two stages: outer model evaluation and inner model evaluation.

The outer model evaluation was conducted to assess the validity and reliability of the research instruments. This stage included testing convergent validity through outer loading values and Average Variance Extracted (AVE), discriminant validity using the Heterotrait-Monotrait Ratio (HTMT), and reliability through composite reliability values.

Meanwhile, the inner model evaluation was carried out to analyze the relationships among variables by examining the R-square values, Variance Inflation Factor (VIF), and path coefficients. Hypothesis testing was performed using the bootstrapping procedure to obtain t-statistics and p-values, which were used to determine the significance of the relationships among the variables in this study.

Discussion

Measurement Model (Outer Model)

The measurement model was evaluated to ensure that each indicator accurately represented the latent constructs used in the study. Convergent validity was initially assessed using outer loading values, where an indicator is considered valid if it has an outer loading value greater than 0.70 (Yuhana et al., 2024).

The initial testing results indicated that not all indicators satisfied this criterion. Several indicators showed very low outer loading values, including values close to zero and negative values, namely X1.5 (-0.004), X1.8 (0.295), X2.8 (0.132), X2.9 (-0.062), Y1.3 (0.125), Y1.5 (-0.077), and Z1.2 (0.084). These results suggest that the indicators did not demonstrate a strong relationship with the latent constructs they were intended to measure. Consequently, the indicators were considered unable to consistently represent the variables, and their inclusion could potentially reduce the overall quality of the measurement model.

Based on these findings, indicators that did not meet the required criteria were eliminated to improve the model. This stage aimed to enhance construct validity by retaining only the indicators that were relevant and capable of accurately measuring the

constructs. Following the elimination process, the re-evaluation results showed that all remaining indicators had outer loading values above 0.70. These results indicate that the retained indicators fulfilled the requirements for convergent validity and were therefore suitable for further analysis because they demonstrated strong correlations with their respective latent variables.

The measurement model after the elimination process is presented in Figure 2. The figure demonstrates that all retained indicators adequately represent the constructs of e-service quality, customer engagement, customer satisfaction, and customer loyalty, while also satisfying the requirements for convergent validity.

Measurement Model (Outer Model)

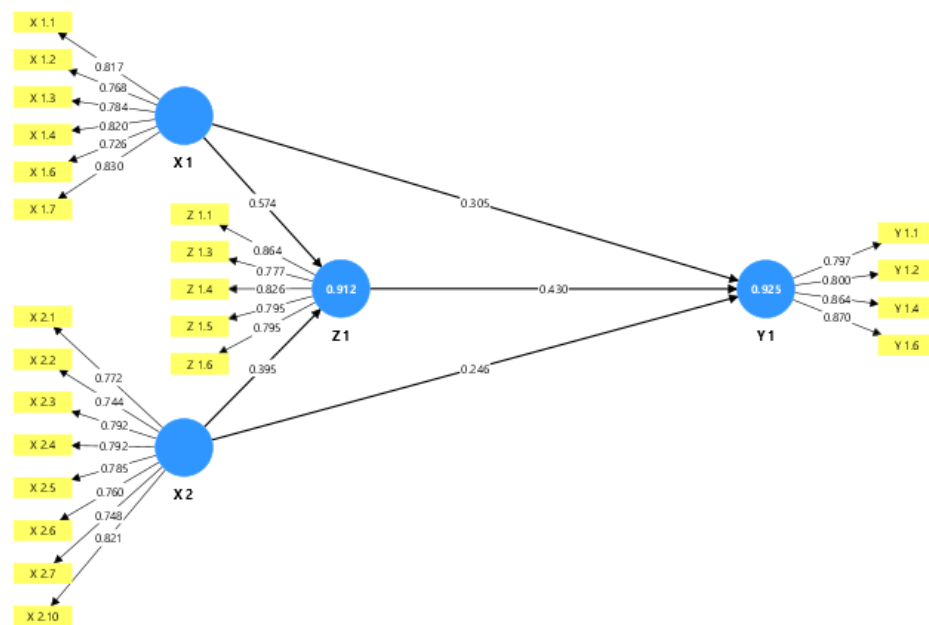


Figure 2, a representation of the measurement model after indicators are removed, illustrates the connections between latent constructs and their relevant indicators. The outer loading levels for each indicator are shown in further detail in Table 2.

Final Outer Loading

	X 1	X 2	Y 1	Z 1
X 1.1	0.817			
X 1.2	0.768			
X 1.3	0.784			
X 1.4	0.820			
X 1.6	0.726			
X 1.7	0.830			
X 2.1		0.772		
X 2.10		0.821		
X 2.2		0.744		
X 2.3		0.792		
X 2.4		0.792		
X 2.5		0.785		
X 2.6		0.760		
X 2.7		0.748		
Y 1.1			0.797	
Y 1.2			0.800	
Y 1.4			0.864	
Y 1.6			0.870	
Z 1.1				0.864
Z 1.3				0.777
Z 1.4				0.826
Z 1.5				0.795
Z 1.6				0.795

The values presented in the table indicate that all indicators possess high loading values, suggesting that each indicator contributes strongly to the formation of the measured latent constructs. Cronbach's Alpha, Composite Reliability, and AVE scores were used in additional testing to assess the constructs' general validity and reliability.

Reliability dan AVE

Variable	Cronbach's Alpha	Composite Reliability	AVE
E-Service Quality	0.880	0.910	0.627
Customer Engagement	0.906	0.924	0.604
Customer Loyalty	0.853	0.901	0.695
Customer Satisfaction	0.870	0.906	0.659

Every variable's CA score is more than 0.70, suggesting that each construct's indicators exhibit strong internal consistency. The constructions' high degree of dependability is further supported by the Composite dependability values, which are likewise higher than 0.70. Furthermore, every variable's AVE value is >0.50, suggesting that the constructs can account for most of the variance in their indicators. As a result,

every construct used in this study may be regarded as legitimate and trustworthy.

HTMT approach was used for discriminant validity testing to make sure that each construct is unique from the others.

HTMT

Variable	X1	X2	Y	Z
X1	-			
X2	1.051	-		
Y	1.086	1.061	-	
Z	1.074	1.048	1.094	-

The discriminant validity assessment using the Heterotrait-Monotrait Ratio (HTMT) revealed several values exceeding the commonly accepted threshold of 0.90. These findings indicate a high level of correlation among several constructs within the model.

This condition may arise due to the conceptual proximity of certain variables, particularly customer satisfaction and customer loyalty, which are theoretically closely related in consumer behavior research. The strong relationship between these constructs reflects overlapping dimensions in users' perceptions, especially within digital service contexts where customer satisfaction often directly influences loyalty behavior.

Despite the relatively high HTMT values, the constructs were retained in the model based on strong theoretical justification and empirical relevance. Previous studies have also acknowledged that closely related constructs in behavioral research may exhibit high correlations without necessarily undermining the structural relationships being examined. The structural model evaluation was conducted to determine how well the model explained the relationships among the latent variables. This evaluation included the assessment of R-square values, collinearity statistics, and hypothesis testing using the bootstrapping procedure.

R-Square

Variable	R-Square	Adjusted
Customer Loyalty	0.925	0.924
Customer Satisfaction	0.912	0.911

Customer loyalty is significantly explained by e-service quality, engagement, and enjoyment, as evidenced by the R-square of 0.925. The R-square for customer satisfaction is 0.912, suggesting that engagement and e-service quality have a major impact on

satisfaction.

The VIF test was conducted to ensure that no multicollinearity issues exist that could affect the model estimation results. The findings indicate that most VIF values fall within an acceptable range. Although some indicators show relatively high values, they remain tolerable as they are still relevant to the constructs being measured.

Collinearity Statistic (VIF)

X1	VIF	X2	VIF	Y	VIF	Z	VIF
X1.1	4.628	X2.1	3.071	Y1.1	2.667	Z1.1	4.397
X1.2	3.245	X2.2	2.778	Y1.2	2.676	Z1.3	5.857
X1.3	3.503	X2.3	3.732	Y1.4	5.552	Z1.4	3.553
X1.4	3.595	X2.4	3.036	Y1.6	5.621	Z1.5	6.006
X1.6	2.133	X2.5	4.316			Z1.6	2.617
X1.7	6.572	X2.6	3.386				
		X2.7	3.510				
		X2.10	5.185				

Hypothesis Testing

Using the bootstrapping approach, hypothesis testing was carried out by analyzing the t-statistic and p-value as the foundation for assessing the significance of correlations between variables.

Direct Effects

Relationship	Coefficient	T-Statistic	P-Value
X1 → Y	0.552	3.988	0.000
X1 → Z	0.574	5.495	0.000
X2 → Y	0.416	2.952	0.003
X2 → Z	0.395	3.842	0.000
Z → Y	0.430	3.864	0.000

Every association has p-values less than 0.05 and t-statistic values larger than 1.96. This criterion shows that every association between the variables in the study model is statistically significant. Consequently, this study's direct hypotheses are all accepted.

Mediation Testing

To investigate how customer satisfaction influences the connection between the independent and dependent variables, mediation testing was done.

Indirect Effects

Relationship	Coefficient	T-Statistic	P-Value
X1 → Z → Y	0.247	3.147	0.002
X2 → Z → Y	0.170	2.748	0.006

With t-statistics over 1.96 and p-values below 0.05, the results demonstrate that both mediation routes are significant and that customer satisfaction plays a substantial mediating function between variables.

E-Service Quality Has a Significant Effect on Customer Loyalty

The findings indicate that repeated usage behavior is strongly influenced by users' perceptions of service quality. Users who experience convenience while conducting transactions, such as purchasing mobile credit, making food payments, and performing interbank transfers without additional fees, are more likely to continue using the application. Ease of access, system responsiveness, and service reliability contribute to a consistent and positive user experience. These factors encourage repeated usage behavior, which gradually develops into customer loyalty.

In addition, fast and uninterrupted access to services enhances user comfort and reduces the likelihood of switching to competing applications. The development of loyalty, reflected in repeated usage and continued preference for the same platform, is therefore supported by satisfying service experiences. These findings are consistent with the study conducted by Dirgantari and Widjajanta, (2019), which reported that e-service quality significantly influences customer loyalty in digital services. When a service consistently fulfills users' quality expectations, customers are more likely to remain loyal over time.

Customer Engagement has a Significant Effect on Customer Loyalty

The results of this study indicate that user engagement with the DANA application is developed through continuous interactions involving cognitive, emotional, and behavioral dimensions. Users who pay close attention to application features, feel enthusiastic while using the service, and actively engage with the available functions are more likely to continue using the application. This engagement extends beyond mere transactional activities and also encompasses users' emotional connection to the overall service experience.

Among student users, customer engagement is reflected in their responses to promotional offers, consistent utilization of application features, and willingness to recommend the application to others. Experiences involving active interaction with the platform contribute to the development of stronger relationships between users and the service provider. Over time, these relationships evolve into customer loyalty, as demonstrated by repeated usage behavior and continued preference for the same application.

These findings are consistent with the study conducted by Sudirman and Patwayati, (2021), which reported that customer engagement positively influences customer loyalty. In other words, higher levels of customer engagement reflect stronger bonds between users and the service, thereby increasing the likelihood of loyalty formation.

E-Service Quality has a Significant Effect on Customer Satisfaction

The findings reveal that high-quality services create user experiences that align with customer expectations. Users' perceptions of the service are influenced by several factors, including system security, ease of use, and speed of access. Customers tend to experience higher levels of satisfaction when they are able to complete transactions smoothly and efficiently.

For instance, the DANA application provides convenience through user-friendly features and a simple interface, particularly for first-time users. Positive experiences are further supported by fast transaction processes, efficient QR scanning capabilities, and flexible balance top-up options. These aspects play an important role in shaping the level of satisfaction users experience after utilizing the service.

These findings are consistent with the study conducted by Yanto and Anjarsari, (2021), which demonstrated that e-service quality significantly influences customer satisfaction. Therefore, services that are able to meet or exceed user expectations are more likely to generate higher levels of customer satisfaction.

Customer Engagement has a Significant Effect on Customer Satisfaction

User engagement positively contributes to the overall service experience and enhances customer satisfaction. Users who actively interact with application features and participate in various in-app activities tend to gain more meaningful experiences, leading

to stronger positive perceptions of the service. Among student users, engagement is reflected not only through transactional activities but also through interactions with promotional and communication features within the application. As a result, the service is perceived as more enjoyable, useful, and valuable, which ultimately increases user satisfaction. These findings are consistent with Marta et al. (2019), who reported that customer engagement significantly influences customer satisfaction. Therefore, greater user involvement contributes to higher levels of customer satisfaction.

Customer Satisfaction has a Significant Effect on Customer Loyalty

The findings indicate that customer satisfaction plays a significant role in fostering customer loyalty. Users who are satisfied with the services provided are more likely to continue using the application, as satisfaction results from experiences that meet or exceed their expectations, including transaction convenience, service efficiency, and perceived benefits. Among student users, satisfaction with the DANA application is reflected in repeated use for various daily transactions and a lower tendency to switch to competing services. Moreover, satisfied users are more likely to recommend the application to others, which represents an important dimension of customer loyalty. These findings are consistent with Anggraini and Budiarti (2020), who found that customer satisfaction significantly influences customer loyalty. Therefore, enhancing customer satisfaction is essential for strengthening long-term user loyalty.

The Mediating Role of Customer Satisfaction in the Relationship Between E-Service Quality and Customer Loyalty

The results indicate that customer satisfaction significantly mediates the relationship between e-service quality and customer loyalty. Improvements in e-service quality enhance users' satisfaction, which subsequently increases their likelihood of remaining loyal to the application. In the context of the DANA application, users who experience convenient, efficient, and comfortable transactions tend to report higher levels of satisfaction, encouraging continued use over time. This finding suggests that the influence of e-service quality on customer loyalty operates not only directly but also indirectly through customer satisfaction. Therefore, customer satisfaction serves as a crucial mediating variable that strengthens the effect of e-service quality on customer loyalty. These findings are consistent

with Vicramaditya (2021), who reported that e-service quality affects customer loyalty through customer satisfaction as a mediating variable

Customer Satisfaction Mediates the Effect of Customer Engagement on Customer Loyalty

The results indicate that customer engagement indirectly affects customer loyalty through customer satisfaction. This finding suggests that user engagement alone is insufficient to generate loyalty unless it leads to greater satisfaction. Active interaction with the application provides users with positive and meaningful experiences, which enhance their satisfaction and, in turn, strengthen their loyalty. Therefore, customer satisfaction serves as a key mediating factor linking engagement to loyalty. These findings are consistent with those of Fauziyah et al. (2023), who also reported that customer engagement influences customer loyalty through customer satisfaction as a mediating variable.

Conclusion

This study examines the effects of e-service quality and customer engagement on customer loyalty among DANA digital wallet users, particularly university students in Kediri, with customer satisfaction serving as a mediating variable. The findings reveal that both e-service quality and customer engagement have positive and significant effects on customer satisfaction and customer loyalty.

Furthermore, customer satisfaction was found to have a significant influence on customer loyalty. The mediation analysis also confirmed that customer satisfaction successfully mediates the relationship between e-service quality and customer loyalty, as well as the relationship between customer engagement and customer loyalty. These findings highlight the importance of improving service quality and strengthening user engagement in digital wallet services to enhance customer satisfaction and foster long-term customer loyalty.

Limitations and Future Research

This study has several limitations. It focused solely on e-service quality, customer engagement, customer satisfaction, and customer loyalty, excluding other factors that may

influence user loyalty. In addition, the respondents were limited to university students, which may restrict the generalizability of the findings. The use of cross-sectional data also prevented the observation of changes in user behavior over time. Future studies are therefore encouraged to include additional variables, involve more diverse respondent groups, and employ alternative analytical approaches to achieve a more comprehensive understanding of user loyalty.

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