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Improving digital payment system services: The impact of e-service quality and e-Loyalty on user preferences

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Abstract

This research aims to provide deeper insights into user preferences and the factors influencing their choices in using Digital Payment Systems, particularly in the context of the DANA e-wallet as an alternative to BI-Fast during service improvement periods. The study focuses on key variables such as E-System Quality and E-Loyalty. The findings indicate that the constructs of E-Loyalty and E-Service Quality demonstrate high levels of validity and reliability, and there exists a significant relationship between electronic service quality and electronic loyalty. Data analysis also identifies specific dimensions of DANA e-wallet service quality that have a significant impact on user preferences and loyalty levels. Factors such as compensation, ease of link access, and ease of contacting customer service are aspects that need attention to enhance service quality. Thus, the research conclusion provides valuable guidance for other Digital Payment Systems owners or managers to improve their service quality and strengthen customer relationships, akin to what is done by DANA e-wallet. These findings offer valuable guidance for other e-wallet owners or managers to enhance their service quality, focusing on aspects such as compensation, link access convenience, and ease of contacting customer service. The importance of improving electronic service quality to achieve higher customer loyalty should be emphasized by stakeholders in the digital payment industry, with specific steps that can be taken based on these findings to strengthen customer relationships and maintain competitive advantages.

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Introduction

Indonesia has witnessed rapid growth in internet usage in recent years. This phenomenon reflects not only the development of information technology but also significant changes in societal behaviors and habits. A recent survey released by the Indonesian Internet Service Providers Association (APJII) provides a clear picture of this trend ([Indonesiabaik.id](https://indonesiabaik.id)). According to the APJII survey, internet users in Indonesia reached 215.63 million people during the 2022-2023 period. This marks an increase of 2.67% from the previous period, where the number of users reached 210.03 million people. This figure is equivalent to 78.19% of Indonesia's total population of 275.77 million people. This phenomenon indicates that internet access has become increasingly widespread across the country ([Indonesiabaik.id](https://indonesiabaik.id)).

This development is inseparable from the increasing need for internet access, especially since the Covid-19 pandemic in 2020. Many activities, including work, education, shopping, and entertainment, have shifted to the digital realm in response to social restrictions and movement limitations. This has driven increased internet penetration and overall consumer behavior changes. The increasing trend in internet penetration from year to year also reflects a significant shift in consumer habits. In 2018, internet penetration in Indonesia reached 64.8%, increasing to 73.7% in 2019-2020, and continuing to rise to 78.19% in the latest APJII survey period. Meanwhile, the payment sector has also undergone a massive transformation with the adoption of digital technology. Bank Indonesia (BI) has been actively promoting innovation in payment systems to enhance efficiency, security, and convenience for the public. One significant milestone in this development is the growth of electronic money transactions ([Indonesiabaik.id](https://indonesiabaik.id)).

According to BI data, the value of electronic money transactions continues to grow rapidly. In 2022, the transaction value reached Rp399.6 trillion, growing by 30.84% compared to the previous year. Projections for 2023 indicate further growth, with transaction value estimated to reach Rp495.2 trillion, an increase of 23.9% from the previous year (indonesia.go.id). This increase aligns with the overall development of digital payment systems. More and more people are turning to digital payments as a faster, more efficient, and safer alternative to conventional methods. Public acceptance of digital payments is driven by easy access, diverse options, and the speed of transactions offered by digital payment platforms.

However, in the context of digital payment system development, service improvement is a crucial factor. BI-Fast, which is Bank Indonesia's fast and efficient payment service, is one of the primary options in Indonesia's digital payment ecosystem. Due to its speed and reliability, BI-Fast is the choice of many users for their daily transactions. Up until July 2023, there have been 6 batches with a total of 122 banks and non-bank companies participating in BI Fast (cnbcindonesia.com). During the research period from November 2023 to February 2024, the BI-Fast service underwent several maintenance periods. This was revealed through information provided by Bank Indonesia's official account via their social media (twitter.com/bank_indonesia/status). And until today, the BI-Fast service on several banks that are participants in BI-Fast such as Amar Bank and Mandiri through a pop-up notification still cannot be used (Appendix 01, accessed on February 29, 2024). This maintenance period can affect user experience and pose challenges in its usage. During the service maintenance period, BI-Fast users experienced difficulties in conducting their transactions normally. System disruptions resulted in delays or failures in fund transfers, which in turn could disrupt users' financial activities and daily transactions (bca.co.id).

Over the past two decades, attention to digital payments has gradually increased among users and researchers as it has brought about significant changes in modern e-commerce, which researchers have depicted in various ways, focusing on different aspects such as business, information technology, accounting, and finance ([Ghosh, 2021](#)). FinTech has also introduced

new products such as digital payments, online loans, automatic investments, and personal financial management, transforming the way we interact with money (Pilishvili, 2020).

On the other hand, the development of Digital Payment Systems, which are digital payment platforms such as DANA, Gopay, OVO, Link Aja, Shopee Pay, Sakuku, iSaku, and Astrapay, offers an alternative for users facing challenges with BI-Fast. These platforms provide fast, secure, and efficient payment solutions, as well as offering various features and benefits to their users. When BI-Fast is undergoing maintenance periods, Digital Payment Systems become an attractive option for users who want to continue their transactions without hindrance. The speed, security, and convenience offered by these platforms make them serious competitors in Indonesia's digital payment ecosystem.

However, to understand the extent to which users adopt and are satisfied with these digital payment platforms, further analysis of aspects such as E-service Quality (e-sequel) and e-loyalty is needed. Therefore, the research will focus on E-service Quality, and e-loyalty in the Digital Payment System DANA, DANA stands out as a leading e-wallet in Indonesia in 2024. This application has obtained official permission from Bank Indonesia as a Digital Financial Institution (LKD), providing users with easy access to online and offline payments. Connected to the Directorate General of Population and Civil Registration, the DANA registration process is quick and efficient (financer.com).

DANA's advantages also lie in various ways of topping up balances, ranging from transfers via Internet banking or mobile banking, transfers from friends, to linking with credit cards. Interesting features such as balance transfers, buying and selling transactions, bill payments, and even gold investments make it an attractive choice for users (financer.com).

Enhanced with monthly promos and cashback, DANA strengthens its position as one of the best e-wallets in Indonesia worth considering by users. Despite strong competitors such as Gopay, OVO, Link Aja, Shopee Pay, Sakuku, iSaku, and Astrapay, DANA remains a top choice acknowledged by various renowned media outlets such as Kompas, Detik, Tribunnews, CNBC, Kumparan Financer, and IDN Times (financer.com).

This research aims to provide deeper insights into user preferences and the factors influencing their choices in using Digital Payment Systems as an alternative to BI-Fast during service improvement periods. This study fills the gap from previous research. It will focus on crucial variables such as E-System Quality and E-Loyalty in the e-wallet context, with specific research on the DANA platform, recognized as one of the best by Financer. We will explore which dimensions are most significant in influencing user preferences and how BI-Fast managers can take input and use these findings to enhance their service quality.

Through data analysis, we will identify specific dimensions in DANA's e-wallet service quality that have a significant impact on user preferences and loyalty levels. With a better understanding of these factors, BI-Fast business owners or managers can adjust their strategies to maximize their service quality, which is expected to increase customer loyalty.

With this approach, we hope to provide valuable insights for e-wallet owners or managers, especially DANA, to improve their service quality and strengthen their relationships with customers.

The theory used in this research is the Expectancy Disconfirmation Theory (EDT), formulated by Richard L. Oliver in 1980 (Qazi et al., 2017) (Liu et al., 2019). This theory is used to explain how individuals experience satisfaction or dissatisfaction after purchasing a product and comparing it with their expectations for the product (Mufidah EN, 2021). This theory emphasizes the comparison between what consumers expect from a product or service and what they perceive or receive after experiencing it (Sweeny, 2018).

This theory is a development of the Cognitive Dissonance Theory by adding the element of expectations or expectations as factors that influence customer satisfaction (Oliver &

[Bearden, 1985](#)). Expectancy Disconfirmation Theory, or EDT for short, is a development of the Cognitive Dissonance Theory first introduced by Leon Festinger in 1957 with the basic assumption that inconsistency between individual beliefs and reality can trigger unpleasant cognitive tension.

The four main constructs in the Expectancy Disconfirmation Theory model are Expectations, Performance, Disconfirmation, and Satisfaction ([Sweeny, 2018](#)).

1. Expectations: These are the initial beliefs or preconceptions that customers have about a product or service before they experience it directly. Expectations can be based on marketing communication, reviews from others, past experiences, or brand reputation ([Oliver & Bearden, 1985](#)).
2. Performance: It is the experience perceived by customers regarding the product or service. This performance is often measured against standards set by customers themselves or through comparison with competitor products or services ([Oliver & Bearden, 1985](#)).
3. Disconfirmation: Disconfirmation arises when there is a difference between expectations (hopes) and performance (experienced reality). This can be positive (performance exceeds expectations) leading to satisfaction, or negative (performance below expectations) leading to dissatisfaction ([Oliver & Bearden, 1985](#)).
4. Satisfaction: Satisfaction is the emotional response or reaction of customers to the disconfirmation experienced. If customers experience positive disconfirmation (performance better than expectations), they tend to feel satisfied, while negative disconfirmation often leads to dissatisfaction ([Oliver & Bearden, 1985](#)).

E-service Quality is an assessment of how well the quality of service is provided via the Internet. This includes factors such as website usability, information reliability, security, responsiveness, and personalization. E-service Quality is important because it directly affects customer satisfaction and loyalty (E-satisfaction and e-loyalty) towards online services. Frameworks such as E-S-QUAL are often used to evaluate electronic service quality and assist companies in improving their online services to achieve higher customer satisfaction (Swaid & Wigand, 2009) ([Yang et al., 2003](#)). The study results suggest that the quality of E-services has a favorable effect on the satisfaction and loyalty of shippers ([Chao et al., 2024](#)). Based on other research, a strong relationship between Electronic Service Quality and Loyalty Intent can be inferred ([Zehir & Narcikara, 2016](#)) ([Borishade et al., 2021](#)).

Based on the analysis results from several studies, the dimensions of E-service Quality that influence electronic satisfaction include several aspects ([Çelik, 2021](#)).

1. System Availability: This includes the availability of functioning features on the website, without disruptions or technical failures hindering usage ([Çelik, 2021](#)).
2. Fulfillment: This dimension covers the process of providing sought-after products and services, as well as safe and timely delivery ([Çelik, 2021](#)).
3. Responsiveness: Describes the website's willingness to address issues experienced by consumers promptly and responsively ([Çelik, 2021](#)).
4. Compensation: The website's ability to compensate consumers for the issues they experience is included in this dimension ([Çelik, 2021](#)).
5. Efficiency: Focuses on the speed and ease of access to the website to ensure an efficient user experience ([Çelik, 2021](#)).
6. Privacy: Involves the protection of customer data and information as well as the assurance of the security of customer's personal information ([Çelik, 2021](#)).
7. Contact: The ability for consumers to contact the website via phone or online representative is also an important aspect of electronic service quality ([Çelik, 2021](#)).

E-loyalty refers to the level of customer loyalty to a brand or company in an online environment. It is a measure of how strong and sustainable the customer's relationship with the brand is through online interactions, which includes the tendency for repeat purchases, as well as recommending the brand to others electronically (eWOM). The presence of e-loyalty is driven by various factors including customer satisfaction, trust, and commitment to the community or the brand online (Balakrishnan et al., 2014) (Chan-Olmsted et al., 2020).

According to Griffin (2010) and Mashuri (2020), four aspects of consumer loyalty include:

1. Regular repeat purchases, refer to the consumer's tendency to purchase products or services periodically and frequently.
2. Cross-product and service purchases refer to consumer behavior in purchasing.
3. Referring to others, which relates to consumer actions in recommending products or services to others or providing positive feedback.
4. Showing resilience to competitor attraction, depicting how consumers remain loyal and maintain their preferences for a particular product or service without being influenced by competitors.

Methodology

This research will utilize a quantitative research method with a statistical verification analysis approach (Campbell & Gardner, 1988). The quantitative method is a systematic scientific approach to test hypotheses and make generalizations based on empirical data, with an emphasis on collecting objective data and appropriate statistical analysis. Verification analysis is the process of checking the truth or validity of information, data, or hypotheses, to ensure that the statements are supported by valid and reliable evidence. Statistical analysis will be used to analyze data, test hypotheses, and provide empirical evidence supporting or rejecting the proposed claims, thus providing a deeper understanding of the relationships between variables and the significance of research findings.

The population in this study includes DANA e-wallet users. Meanwhile, the sample is a subset of the population selected to represent the population as a whole. The sampling method used is purposive random sampling, which allows researchers to select samples considered most relevant or representative for specific research purposes (Al-Sekait et al., 1992). This approach enables researchers to generate samples tailored to the specific research needs, which can yield rich and representative data. The determined sample size is 210 respondents, based on Hair et al.'s calculation method of multiplying the number of research indicators by 7.5 (Wati, 2021:96). Thus, the sample size used in this study is 210 DANA e-wallet users.

In this study, data will be collected through the distribution of questionnaires using a Likert scale, which is a method of data collection with written statements online using Google Docs to respondents. The measurement in the questionnaire will use a Likert scale from 1 to 7. Previous research by Weksi Budiaji in 2013 suggested that a 7-point Likert scale is preferred by respondents and more effective in measuring individual traits such as knowledge or attitudes. Therefore, a Likert scale ranging from 1 to 7 will be used to measure E-service Quality, E-satisfaction, and E-loyalty in the context of the Digital Payment System DANA. Each answer in the questionnaire will have a code and a specific value, ranging from "Strongly Disagree" with the code "SD" and a value of 1, to "Strongly Agree" with the code "SA" and a value of 7. This allows for depicting the strengths or weaknesses of the variables under study (Tarka, 2017).

Data sources in this study include primary data and secondary data. Primary data is information obtained directly from data collection, such as surveys, interviews, or observations (Mohsin et al., 2023). Meanwhile, secondary data is information collected by others and

available for use by researchers. Primary data in this study is obtained through the distribution of questionnaires to DANA e-wallet users. On the other hand, secondary data is data that has been collected previously by others or organizations for different purposes but can be used by researchers as an additional source of information. This secondary data includes relevant readings from national journals, international journals, and other scholarly works relevant to the research issue. Thus, both types of data will be used to support analysis and research in this study.

Statistical verification analysis involves the use of statistical techniques and methods to collect, organize, analyze, and interpret data to verify research hypotheses or claims. Hypothesis testing will be conducted using Partial Least Square (PLS) as a method of structural equation modeling (SEM) analysis, which provides flexibility in modeling relationships between variables and allows for evaluating the overall model quality. The criteria used in testing are the statistical significance values indicating significant influence or relationships between variables (Dan et al. n. d).

Result and Discussion

Table 1. Distribution of Respondent

Row Labels	Count of Gender
Female	105
Male	105
Grand Total	210
Row Labels	Count of Education
D3	67
S1	57
S2	19
SMA	67
Grand Total	210
Row Labels	Count of Island
Bali	19
Jawa	95
Kalimantan	19
Sulawesi	19
Sumatera	58
Grand Total	210

Source: Data processing by the researcher, 2024

Based on the distribution of respondents presented in Table 1, there were a total of 210 respondents involved in this study. In terms of gender, the number of female and male respondents is equal, with 105 each. In terms of education, the respondents are predominantly high school and diploma graduates, with 67 each, followed by bachelor's degree graduates with 57 respondents, and master's degree graduates with 19 respondents. When looking at the geographical locations, the majority of respondents are from Java with 95 individuals, followed by Sumatra with 58 individuals, and an equal number of respondents from Bali, Kalimantan, and Sulawesi, with 19 individuals each for these islands. Thus, the distribution of respondents shows a fairly even variation in terms of gender, education, and geographical location, providing a broad perspective for the analysis of this study.

Table 2. Outer Loading, Cronbach's Alpha, rho_A, Composite Reliability Average Variance Extracted (AVE), R Square R Square Adjusted

	E-Loyalty	E-service Quality
X_1		0.899
X_2		0.885
X_3		0.891
X_4		0.901
X_5		0.893
X_6		0.922
X_7		0.932
X_8		0.924
X_9		0.925
X_10		0.932
X_11		0.840
X_12		0.883
X_13		0.913
X_14		0.905
X_15		0.916
X_16		0.919
X_17		0.918
X_18		0.943
X_19		0.914
Y_1	0.773	
Y_2	0.963	
Y_3	0.873	
Y_4	0.969	
Y_5	0.970	
Y_6	0.954	
Y_7	0.966	
Y_8	0.961	
Y_9	0.827	
	Cronbach's Alpha	rho_A
E-Loyalty	0.977	0.981
E-service Quality	0.988	0.988
	Composite Reliability	Average Variance Extracted (AVE)
E-Loyalty	0.980	0.846
E-service Quality	0.989	0.825
	R Square	R Square Adjusted
E-Loyalty	0.843	0.843

Source: Data processing by the researcher, 2024

The data analysis results indicate that the constructs of E-Loyalty and E-Service Quality show high levels of validity and reliability. For E-Loyalty, the Cronbach's Alpha and rho_A values are 0.977 and 0.981 respectively, demonstrating excellent internal consistency (Al-dweeri et al., 2019). Additionally, the values of Composite Reliability and Average Variance Extracted (AVE) for E-Loyalty are 0.980 and 0.846 respectively (Ahmad et al., 2017), exceeding the required threshold to ensure construct reliability and validity. Similarly, for E-Service Quality, which has Cronbach's Alpha and rho_A values of 0.988 and 0.988 respectively (Fatikah & Al-Banna, 2022), and Composite Reliability and AVE values of 0.989 and 0.825 respectively (Taherdoost, 2019), indicating high reliability and validity. Overall, both constructs can be relied upon for further analysis. Moreover, the R Square coefficients indicate

that the E-Loyalty variable can explain approximately 84.3% of the variation in the data, indicating a good fit between the tested model and the observed data (Баркалов et al., 2020).

The bootstrapping results of the study indicate a significant relationship between electronic service quality (E-Service Quality) and electronic loyalty (E-Loyalty). The obtained path coefficient is 0.918, with Confidence Intervals ranging from 0.905 to 0.932, suggesting that each unit increase in electronic service quality is followed by a 0.918 unit increase in electronic loyalty.

Bootstrapping analysis also shows a very small p-value ($p = 0.000$), indicating that the relationship between E-Service Quality and E-Loyalty is not occurring by chance and is statistically significant. The high t-statistics value (73.332) also indicates that this relationship is very strong and unlikely to occur by chance.

Thus, the research findings provide strong support for the positive relationship between electronic service quality and electronic loyalty, highlighting the importance of paying attention to and improving electronic service quality to achieve higher customer loyalty (Juwaini et al., 2022), (Li et al., 2023), (Al-dweeri et al., 2019), (Fatikah & Al-Banna, 2022), (Lionello et al., 2020), (Kaur, 2018).

Based on the data analysis results of statement indicators for the E-Service Quality dimension in the context of the DANA e-wallet, it can be seen that some aspects significantly influence service quality. From these results, it can be concluded that 100% compensation has the most significant influence, followed by ease of accessing links and ease of contacting customer service. This indicates that BI-fast owners or other digital payment operators can focus on these aspects to improve their service quality. Additionally, other factors that also have a significant influence include the service's ability to fully resolve issues, guarantee data privacy, and ensure timely issue resolution. By focusing efforts on these aspects, they can maximize their service quality, enhance customer satisfaction, and strengthen their position in the digital payment market.

Conclusion

This research aims to provide deeper insights into user preferences and the factors influencing their choices in using the Digital Payment System, particularly in the context of the DANA e-wallet, as an alternative to BI-Fast during the service improvement period. The research focuses on important variables such as E-System Quality and E-Loyalty. The results indicate that the constructs of E-Loyalty and E-Service Quality have high levels of validity and reliability, and there is a significant relationship between electronic service quality and electronic loyalty. This underscores the importance of enhancing electronic service quality to achieve higher customer loyalty. Data analysis also identifies specific dimensions within the DANA e-wallet service quality that have a significant impact on user preferences and loyalty levels. Factors such as provided compensation, ease of accessing links, and ease of contacting customer service are aspects that need to be considered to improve service quality. Thus, the conclusions of this research provide valuable guidance for owners or managers of other e-wallets to enhance their service quality and strengthen their relationships with their customers, as done by the DANA e-wallet.

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