The Effect of Digital Transformation, User Experience, and User Interface on Customer Loyalty in Technology Startups in Bandung

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ABSTRACT

This study investigates the influence of digital transformation, user experience (UX), and user interface (UI) on customer loyalty in technology startups in Bandung, Indonesia. A quantitative approach was employed, with data collected from 150 respondents using a Likert scale ranging from 1 to 5. The data were analyzed using SPSS version 26, and multiple regression analysis was used to determine the significance of the relationships between the variables. The results reveal that digital transformation, UX, and UI all have positive and significant effects on customer loyalty, with UX being the strongest predictor. These findings provide important insights for technology startups in Bandung, suggesting that enhancing digital processes, optimizing UX, and refining UI design can foster greater customer loyalty. This study contributes to the growing body of literature on the role of digital transformation and customer-centric design in building long-term customer relationships in the startup ecosystem.

Keywords: Digital Transformation, User Experience, User Interface, Customer Loyalty, Technology Startups

1. INTRODUCTION

Rapid technological advancements have reshaped the startup ecosystem, with digital transformation (DT) enhancing operations, customer engagement, and loyalty. Startups increasingly adopt digital tools to adapt to market changes and optimize business models. A key factor is the emphasis on information exchange with their environment, driving digital business transformation (DBT) and adapting business models to market uncertainty [1]. AI and machine learning (ML) integration enables automation, improves efficiency, and addresses big data challenges, fostering innovation in areas like data analysis and health monitoring [2]. Digital technologies also reshape supply-demand dynamics, encouraging startups to optimize resources and form partnerships [3]. Open innovation further boosts entrepreneurial potential by leveraging internal and external ideas [3]. As tech diffusion continues, startups explore new business opportunities, connecting assets and fostering collaborative environments [4], [5].

Digital transformation is crucial for tech startups in competitive markets like Bandung, Indonesia, as it drives innovation and improves customer experience. By integrating digital technologies, startups can streamline operations and create new value propositions to stay competitive. This transformation influences business model innovation (BMI), enabling startups to explore models like frugal innovation and the circular economy, impacting value creation across industries [6]. Frameworks promoting information exchange help startups adapt to market changes [1]. It also involves societal interactions, requiring startups to consider evolving dynamics [7]. AI and machine learning integration enhances automation and data analysis, boosting efficiency and

innovation [2]. The Digital Innovations and Transformation Process (DITP) offers a structured approach for aligning business management with technology [8].

User experience (UX) and user interface (UI) are critical in shaping customer satisfaction and loyalty, particularly in technology-driven industries. Startups that prioritize these elements can foster positive interactions, leading to sustainable growth and a competitive edge. UX is essential for the commercial success of digital products, as it encompasses users' perceptions and responses to a product or service [9], [10]. It balances usability and accessibility with emotional design elements, creating engaging ecosystems that enhance customer satisfaction and loyalty, as seen in examples like Apple's iPhone and Amazon [11]. Measuring UX through formal methods can integrate it effectively into product development [10]. UI, focusing on the visual and interactive aspects, plays a crucial role in shaping the overall user experience by creating positive first impressions [11]. The design thinking approach emphasizes innovative UI design methods [12]. As cross-channel UX becomes more important, designers must ensure consistency across touchpoints in both physical and digital spaces, with information architecture facilitating seamless navigation [13].

In Bandung, a growing hub for technology startups in Indonesia, competition is fierce. Startups in the city are continually exploring ways to differentiate themselves, and enhancing customer loyalty is a key strategy for long-term success. Given the digital nature of these startups, the effectiveness of digital transformation, UX, and UI in shaping customer loyalty becomes a crucial area of study. Despite its importance, there has been limited empirical research that specifically examines the relationship between digital transformation, UX, UI, and customer loyalty in technology startups within this context. This study aims to fill this gap by examining the influence of digital transformation, UX, and UI on customer loyalty in technology startups in Bandung.

2. LITERATURE REVIEW

2.1 Digital Transformation

Digital transformation enables technology startups to scale quickly, adapt to market shifts, and innovate. This process involves adopting new technologies and transforming business models to boost efficiency and innovation. By leveraging AI, IoT, and big data analytics, startups enhance customer satisfaction and loyalty through personalized experiences [14]. Streamlining operations and improving service quality are key to maintaining competitiveness [15]. Additionally, digital transformation drives business model innovation, creating new revenue streams and increasing efficiency [16]. However, challenges like cultural resistance and regulatory issues demand strategic planning [17], while ensuring data privacy is critical for successful implementation [14]. However, the relationship between digital transformation and customer loyalty in startups, particularly in developing economies like Indonesia, remains underexplored, warranting further investigation [18].

2.2 User Experience (UX)

User experience (UX) is a multi-dimensional concept involving a user's perceptions, emotions, and interactions with a digital product or service. [19] defines UX as how users feel about a system's functionality and its ability to meet their needs and expectations. For technology startups, where digital platforms like mobile apps and websites are the main channels for customer interaction, delivering excellent UX is

essential for retaining users and fostering long-term loyalty. Studies have shown that a positive UX, marked by ease of use, aesthetic appeal, and functional efficiency, significantly boosts customer satisfaction and loyalty [20], [21]. [22], [23] also highlights that UX creates a competitive advantage, as satisfied users are more likely to become repeat customers and brand advocates. In tech startups, particularly in saturated markets like Bandung, a superior UX can serve as a key differentiator from competitors.

2.3 *User Interface (UI)*

User Interface (UI) refers to the design and layout of digital products that facilitate user interaction with the system, incorporating visual elements like buttons, icons, and menus to help users navigate efficiently. UI design is closely tied to User Experience (UX), as an intuitive and visually appealing interface enhances the overall user experience. [24], [25] notes that an effective UI should be simple, aesthetically pleasing, and responsive, reducing cognitive load and making interactions smoother. [26] highlights that a well-designed UI is crucial for retaining users and ensuring a positive experience with digital products, contributing to customer satisfaction and loyalty. In tech-heavy regions like Bandung, UI design becomes a key differentiator in a competitive startup market, where high-quality interfaces can attract and retain customers who value well-designed digital products [21], [22].

2.4 *Customer Loyalty*

Customer loyalty refers to a customer's commitment to consistently repurchase or continue using a brand's products or services, driven by factors such as product quality, satisfaction, and overall experience [27], [28]. Loyal customers are valuable assets, as they spend more, offer referrals, and are less sensitive to price changes, making them critical for startups seeking rapid growth [29]. Studies have highlighted the connection between digital transformation, UX, UI, and customer loyalty. [30] found that companies with robust digital strategies and customer-centric designs are more likely to build lasting relationships. Additionally, [31] emphasize the role of digital transformation in creating personalized, seamless experiences that foster loyalty. For tech startups, where user acquisition and retention are essential, building loyalty through digital transformation, UX, and UI is a key strategic priority.

2.5 *Theoretical Framework*

This study is based on the Technology Acceptance Model (TAM), which asserts that perceived ease of use and perceived usefulness are key determinants in the adoption and continued use of technology (Davis, 1989). In this context, digital transformation, UX, and UI influence the perceived usefulness and ease of use of a startup's digital platform, thereby impacting customer satisfaction and loyalty. By integrating these elements into the theoretical framework, the study aims to explore how technology startups in Bandung can leverage digital strategies to enhance customer loyalty. While substantial research exists on digital transformation, UX, and UI, the relationship between these factors and customer loyalty in technology startups, particularly in emerging markets like Indonesia, remains underexplored. Most studies focus on large corporations or developed countries, and this research seeks to fill this gap by

examining how these factors affect customer loyalty in Bandung's growing technology startup ecosystem.

3 METHODS

3.1 Research Design

This study employs a quantitative research design to investigate the relationship between digital transformation, UX, UI, and customer loyalty in technology startups. By using a quantitative approach, the study allows for statistical analysis of the data to determine the significance and strength of the relationships between the independent variables (digital transformation, UX, and UI) and the dependent variable (customer loyalty). A structured survey was utilized to collect data from respondents, ensuring consistency in responses. The population consists of customers of technology startups in Bandung, Indonesia, across industries such as fintech, e-commerce, and digital services, all of which have undergone substantial digital transformation. A non-probability convenience sampling method was employed, targeting customers actively using the digital platforms of these startups. A sample size of 150 respondents was selected, deemed adequate for providing sufficient statistical power to detect significant relationships, with respondents chosen based on their experience and familiarity with the startups' digital platforms.

3.2 Data Collection

Data was collected through an online questionnaire distributed to customers of technology startups in Bandung. The questionnaire was designed using a Likert scale to measure respondents' perceptions of digital transformation, UX, UI, and customer loyalty. Each item on the scale ranged from 1 (strongly disagree) to 5 (strongly agree), allowing for nuanced responses that reflect the intensity of respondents' opinions.

3.3 Data Analysis

Data analysis was conducted using SPSS version 26, a widely recognized software for statistical analysis in social sciences. The process began with descriptive statistics, calculating means, standard deviations, and frequency distributions to summarize respondent demographics and responses to key constructs. Reliability testing was performed using Cronbach's Alpha, with a threshold of 0.7 to ensure acceptable internal consistency. Pearson correlation analysis was then conducted to examine the relationships between digital transformation, UX, UI, and customer loyalty, providing initial insights into the strength and direction of these relationships. Multiple regression analysis was used to test the hypotheses and assess the impact of digital transformation, UX, and UI on customer loyalty, with the model formulated as follows: Customer Loyalty = $\beta 0 + \beta 1$ (Digital Transformation) + $\beta 2$ (UX) + $\beta 3$ (UI) + ϵ, where $\beta 0$ is the intercept, $\beta 1$, $\beta 2$, and $\beta 3$ are the regression coefficients for digital transformation, UX, and UI, respectively, and ϵ is the error term. Hypotheses were tested at a 5% significance level ($p < 0.05$), with the regression results determining whether the independent variables had a statistically significant impact on customer loyalty.

4 RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics provide insights into the respondents' demographics and their perceptions of digital transformation, user experience (UX), user interface (UI), and customer loyalty. Of the 150 respondents, 52% were male and 48% were female, with 65% aged between 20 and 30, reflecting the youthful user base typical of technology startups. About 70% had been using the startups' platforms for over a year. The average score for digital transformation was 4.12, indicating that respondents generally believed the startups had effectively integrated digital technologies. UX was rated at an average of 4.25, showing that users found the platforms easy to use and functional,

while UI scored 4.10, reflecting satisfaction with the design and interactivity. Customer loyalty had an average score of 4.20, suggesting a high likelihood of repeat usage and recommendations.

4.2 Reliability Testing

To ensure the internal consistency of the measurement instruments, Cronbach's Alpha was calculated for each construct, and all constructs exceeded the acceptable reliability threshold ($\alpha > 0.7$), indicating strong internal consistency. Digital Transformation had a Cronbach's Alpha of 0.853, User Experience (UX) was 0.896, User Interface (UI) scored 0.844, and Customer Loyalty had 0.872. These values suggest that the items used to measure these constructs are reliable and consistent across respondents.

4.3 Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between digital transformation, UX, UI, and customer loyalty, revealing positive and statistically significant correlations between all variables. The correlation between digital transformation and customer loyalty was r = 0.634 (p < 0.01), UX and customer loyalty was r = 0.723 (p < 0.01), UI and customer loyalty was r = 0.666 (p < 0.01), digital transformation and UX was r = 0.684 (p < 0.01), and UX and UI was r = 0.706 (p < 0.01). These results suggest that improvements in digital transformation, UX, and UI are associated with increased customer loyalty, with the strongest correlation between UX and customer loyalty, highlighting the critical role of user experience in driving loyalty.

4.4 Multiple Regression Analysis

Multiple regression analysis was used to determine the influence of digital transformation, UX, and UI on customer loyalty. The model was statistically significant (F = 45.32, p < 0.01), with an R² value of 0.57, indicating that 57% of the variance in customer loyalty can be explained by the three independent variables: digital transformation, UX, and UI.

Table 1. Multiple Regression

Variable	Beta (β)	t-value	p-value
Digital Transformation	0.305	4.502	< 0.01
User Experience (UX)	0.423	6.104	< 0.01
User Interface (UI)	0.335	5.006	< 0.01

All three independent variables—digital transformation, UX, and UI—were found to have a positive and statistically significant effect on customer loyalty. User experience had the strongest influence (β = 0.423), followed by UI (β = 0.335) and digital transformation (β = 0.30).

Discussion

The results of this study underscore the significance of digital transformation, UX, and UI in driving customer loyalty for technology startups in Bandung. Each of these factors had a positive and significant impact on customer loyalty, indicating that startups prioritizing these areas are more likely to retain customers and build lasting relationships. Digital transformation was shown to enhance customer loyalty by streamlining operations and offering innovative solutions that meet evolving customer needs, consistent with previous research [32], [33]. User experience (UX) emerged as the strongest predictor of customer loyalty, reinforcing the importance of intuitive, functional, and user-friendly platforms in engaging customers and encouraging repeat usage, as noted by [31], [34]. Additionally, a well-designed user interface (UI) significantly contributed to customer loyalty by improving navigation and task efficiency, supporting [31], [32], [35]findings that an aesthetically pleasing and functional UI enhances user retention. In Bandung's competitive tech ecosystem, startups that invest in digital transformation, UX, and UI are better positioned to attract, retain, and build loyalty among their customers.

Implications for Technology Startups

The findings of this study provide several practical implications for technology startups in Bandung. First, startups should prioritize digital transformation to remain competitive and improve customer experiences by streamlining operations and delivering value through innovative digital solutions. Second, the critical role of UX in driving customer loyalty emphasizes the need for user-centric design practices, ensuring digital platforms are easy to use, functional, and tailored to the target audience. Continuous UX improvements will help engage customers and foster long-term loyalty. Lastly, UI design is equally important; startups should create visually appealing and user-friendly interfaces that enhance the overall user experience, differentiating their platforms from competitors and contributing to higher customer loyalty.

CONCLUSION

This study explored the impact of digital transformation, user experience (UX), and user interface (UI) on customer loyalty in technology startups in Bandung, Indonesia. The results confirm that all three factors have a significant and positive influence on customer loyalty. UX was found to be the strongest predictor, highlighting the importance of creating user-centric platforms that offer intuitive and seamless experiences. Digital transformation also plays a vital role by enabling startups to enhance operational efficiency and deliver value to customers in innovative ways. Additionally, the quality of UI design contributes significantly to customer satisfaction and loyalty by providing aesthetically pleasing and functional interfaces.

For technology startups in Bandung, the findings suggest that prioritizing digital transformation, UX, and UI improvements is essential for retaining customers and fostering long-term loyalty. Startups that invest in these areas are better positioned to differentiate themselves from competitors and achieve sustainable growth. The study's insights offer practical guidance for startup founders and digital strategists looking to enhance their customer engagement strategies in the rapidly evolving tech landscape. Future research could explore these relationships in other emerging markets to further validate the findings.

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