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Service Quality, Product Quality, and Customer Satisfaction as Predictors of Customer Loyalty: Evidence from an Internet Service Provider in Indonesia

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ABSTRACT

This study investigates the influence of service quality and product quality on customer loyalty, specifically examining the mediating role of customer satisfaction within the context of an Indonesian Internet Service Provider (ISP). Adopting a quantitative approach, the research utilizes Structural Equation Modeling (SEM) to analyze data obtained through proportional random sampling. The analytical framework incorporates confirmatory factor analysis and Sobel mediation testing to ensure a rigorous evaluation of the proposed model. The findings demonstrate that both service quality and product quality significantly influence customer satisfaction, which in turn serves as a strong predictor of customer loyalty. Furthermore, customer satisfaction is found to partially mediate the relationship between these quality dimensions and loyalty. These results offer theoretical advancement in understanding loyalty formation within emerging digital markets and provide practical guidance for ISPs to enhance retention strategies through integrated quality improvements. This research contributes novel empirical evidence on the joint effects of service and product quality in developing digital service environments, effectively addressing existing literature gaps regarding the mediation mechanisms that drive customer loyalty.

Keywords: Service Quality; Product Quality; Customer Satisfaction; Customer Loyalty; Internet Service Provider

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INTRODUCTION

Customer loyalty has emerged as a critical strategic imperative across service industries, particularly as global markets experience unprecedented digital transformation and intensifying competition (Kumar & Reinartz, 2018; Zeithaml et al., 2002). Recent international reports indicate that acquiring new customers costs five to seven times more than retaining existing ones, making loyalty a fundamental driver of organizational profitability and long-term sustainability (Reichheld & Schefter, 2000). In the telecommunications sector specifically, customer retention rates have become increasingly challenging, with global average churn rates ranging from 20% to 40% annually in developing markets (Keramati et al., 2016).

The global Internet Service Provider (ISP) industry has witnessed remarkable growth, with worldwide internet users surpassing 5.3 billion in 2023, representing approximately 66% of the global population (International Telecommunication Union, 2023). This expansion has intensified competition among service providers, compelling them to differentiate through superior service delivery and product performance (Huang & Nuangjamnong, 2024; Zhou et al., 2019). In Indonesia, internet penetration has increased dramatically from 54.7% in 2018 to 77.02% in 2023, reflecting 212.9 million users (Asosiasi Penyelenggara Jasa Internet Indonesia [APJII], 2023). Despite this growth, Indonesian ISPs continue to face significant challenges related to service reliability, network stability, and customer satisfaction inconsistencies, which directly impact loyalty behaviors (Prasetyo et al., 2021).

Existing research on customer loyalty consistently identifies service quality, product quality, and customer satisfaction as fundamental determinants of loyalty across various industries (Islam et al., 2021; Zygiaris et al., 2022; Putri & Efawati, 2025). Service quality, conceptualized through dimensions such as reliability, responsiveness, assurance, empathy, and tangibles (Parasuraman et al., 1988), has been extensively examined in hospitality (Ali et al., 2014), banking (Ribbink et al., 2004), and retail contexts (Sivadas & Baker-Prewitt, 2000). Similarly, product quality encompassing performance, reliability, durability, and conformance (Garvin, 1987) remains a critical driver of customer evaluations, particularly in technology-intensive services where functional performance directly affects user experience (Gupta et al., 2023; Thariq & Efawati, 2025).

Despite this substantial body of research, several critical gaps persist in the literature. First, while numerous studies examine service quality and product quality independently (Abd-Elrahman, 2023; Chatterjee & Rahman, 2023), fewer investigate their simultaneous and interactive effects within a unified empirical framework, particularly in digital service environments (Huang & Nuangjamnong, 2024, Efawati et al., 2025). Second, findings regarding the direct versus mediated effects of quality dimensions on loyalty remain inconsistent across contexts (Buhler et al., 2024; Wireko-Gyebi et al., 2024). Some studies report strong direct paths from service quality to loyalty (Yum & Yoo, 2023), while others emphasize satisfaction as the dominant mediating mechanism (Ribeiro et al., 2024; Uzir et al., 2021). These contradictions suggest that the strength and nature of these relationships may vary significantly across cultural contexts and industry settings (Singh et al., 2023).

Third, research specifically focused on ISP contexts in emerging economies remains limited (Prasetyo et al., 2021). Most existing studies originate from developed markets where service infrastructure, competitive dynamics, and customer expectations differ markedly from those in developing economies (Sahid & Abadi, 2024). The Indonesian ISP market presents a unique context characterized by rapid technological adoption, diverse socioeconomic customer segments, and infrastructure challenges that

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collectively shape distinct loyalty patterns (Hanindita & Riorini, 2023). Understanding how quality perceptions jointly influence satisfaction and loyalty in this environment offers valuable insights for both theoretical development and managerial practice.

Fourth, while customer satisfaction is widely recognized as a mediating variable linking quality perceptions to loyalty outcomes (Pereira et al., 2016; Singh et al., 2023), the mechanisms through which this mediation occurs particularly whether satisfaction fully or partially mediates quality effects require further clarification in specific industry contexts (Zhou et al., 2019). Additionally, the relative importance of service quality versus product quality in driving satisfaction and loyalty within technology-based services warrants deeper investigation (Gupta et al., 2023).

The urgency of this research is underscored by the strategic importance of customer retention in the highly competitive Indonesian ISP market, where switching barriers are relatively low and alternative providers are readily available (Huang & Nuangjamnong, 2024). As internet connectivity becomes increasingly essential for education, commerce, and social interaction, understanding the drivers of customer loyalty becomes critical for ISPs seeking sustainable competitive advantage (Prasetyo et al., 2021). Moreover, the COVID-19 pandemic has accelerated digital dependency, intensifying customer expectations for reliable, high-quality internet services, thereby making loyalty formation more complex and contextually sensitive (Zygiaris et al., 2022).

Theoretically, this study is grounded in two grand theories that jointly explain the proposed model. First, expectancy disconfirmation theory (Oliver, 1980) posits that satisfaction emerges from the comparison between perceived performance and prior expectations, providing the theoretical rationale for modeling service quality and product quality as antecedents of customer satisfaction. Second, two–factor theory (Herzberg et al., 1959) distinguishes hygiene factors, whose deficiency causes dissatisfaction, from motivators, whose presence enhances satisfaction, offering a complementary lens for understanding how service and product quality dimensions differentially influence satisfaction and, ultimately, loyalty. Together, these grand theories underpin the conceptual model linking service quality and product quality to customer loyalty through the mediating role of customer satisfaction.

This study addresses these gaps by investigating how service quality and product quality jointly influence customer loyalty through the mediating role of customer satisfaction in an Indonesian ISP context. Specifically, the research examines whether quality dimensions exert direct effects on loyalty or whether their influence is primarily channeled through satisfaction. By integrating both service and product quality into a comprehensive structural model, this research provides nuanced insights into loyalty formation mechanisms within emerging digital service markets. The findings contribute to theoretical advancement by clarifying mediation dynamics and offer practical implications for ISPs to design targeted retention strategies that optimize both service delivery and product performance.

Given these considerations, this research seeks to answer the following questions: To what extent do service quality and product quality influence customer satisfaction? How does customer satisfaction affect customer loyalty? Do service quality and product quality exert direct effects on loyalty, or are these effects mediated by satisfaction? What are the relative strengths of these relationships within the Indonesian ISP context?

LITERATURE REVIEW

Service quality represents a critical construct in marketing and service management literature, defined as customers' assessment of the overall excellence or superiority of

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service delivery (Parasuraman et al., 1988; Zeithaml, 1988). The SERVQUAL framework, encompassing tangibles, reliability, responsiveness, assurance, and empathy dimensions, has been widely adopted across diverse service contexts (Parasuraman et al., 1988). Contemporary research continues to validate the significance of service quality in shaping customer perceptions, particularly in digital and technology-intensive services where intangible elements critically influence user experience (Chatterjee & Rahman, 2023; Yum & Yoo, 2023).

Recent empirical evidence demonstrates that service quality dimensions exert substantial influence on customer satisfaction across multiple industries. In telecommunications, Abd-Elrahman (2023) found that reliability, responsiveness, and assurance significantly enhance customer satisfaction, which subsequently drives loyalty behaviors. Similarly, Zhou et al. (2019) established that e-service quality dimensions, including system availability, efficiency, and fulfillment, positively affect both satisfaction and loyalty in telecom settings. Research in mobile social media services further confirms that convenience, usefulness, and service responsiveness significantly elevate satisfaction levels (Yum & Yoo, 2023). In logistics contexts, Gupta et al. (2023) documented that service quality dimensions collectively contribute to enhanced customer satisfaction, thereby supporting loyalty formation. Additionally, Zygiaris et al. (2022) found that service quality significantly affects satisfaction in automotive services during the post-pandemic period, demonstrating the robustness of this relationship across various service sectors.

These findings align with expectancy-disconfirmation theory, which posits that customers form satisfaction judgments by comparing perceived service performance against prior expectations (Oliver, 1980). When service quality meets or exceeds expectations, positive disconfirmation occurs, leading to heightened satisfaction (Zygiaris et al., 2022). However, research gaps remain regarding how service quality operates in emerging market ISP contexts, where infrastructure limitations and service inconsistencies may moderate traditional quality-satisfaction relationships (Huang & Nuangjamnong, 2024). Additionally, while service quality's effect on satisfaction is well-documented, its direct versus mediated influence on loyalty warrants further investigation (Ribeiro et al., 2024).

H1: Service quality has a direct and positive effect on customer satisfaction.

Product quality encompasses the functional and technical attributes of an offering, including performance, reliability, durability, conformance to specifications, features, and perceived quality (Garvin, 1987). In service industries, product quality often refers to the core service output—in ISP contexts, this translates to network performance, connection speed, stability, and bandwidth consistency (Huang & Nuangjamnong, 2024). Contemporary research emphasizes that customers evaluate both service delivery processes and product outcomes when forming overall satisfaction judgments (Sahid & Abadi, 2024).

Empirical studies consistently demonstrate product quality's positive influence on customer satisfaction. Hanindita and Riorini (2023) found that product quality significantly affects satisfaction in restaurant services, where food quality represents the core product. In e-commerce contexts, Utami et al. (2024) established that product quality, alongside service quality, jointly determines customer satisfaction and loyalty. Research examining ride-hailing services confirms that product-related attributes such as vehicle condition, cleanliness, and comfort significantly enhance satisfaction (Sahid & Abadi, 2024). In telecommunications specifically, Huang and Nuangjamnong (2024) documented that perceived internet service quality—reflecting product performance—

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strongly predicts customer satisfaction. Singh et al. (2023) conducted a comprehensive literature review revealing that product quality consistently influences satisfaction across diverse service contexts, though effect magnitudes vary by industry characteristics.

These findings resonate with the two-factor theory, which suggests that both hygiene factors (baseline expectations) and motivators (performance attributes) jointly influence satisfaction (Herzberg et al., 1959). Product quality often functions as a hygiene factor, where deficiencies generate dissatisfaction, while superior performance acts as a motivator enhancing satisfaction (Singh et al., 2023). However, existing research predominantly examines product quality in tangible goods contexts, with limited attention to how product performance operates in digital service environments where technical reliability and system stability constitute the core product (Prasetyo et al., 2021). Moreover, the relative importance of product quality versus service quality in driving satisfaction remains underexplored in ISP settings (Zhou et al., 2019).

H2: Product quality has a direct and positive effect on customer satisfaction.

Customer loyalty reflects a customer's commitment to repurchase or continue using a service, demonstrated through repeat patronage, positive word-of-mouth, and resistance to competitive alternatives (Oliver, 1999). Loyalty represents a multidimensional construct encompassing behavioral intentions (repurchase likelihood, recommendation willingness) and attitudinal components (emotional attachment, brand preference) (Dick & Basu, 1994). Service quality has been identified as a direct antecedent of loyalty across numerous service contexts (Zeithaml et al., 2002).

Empirical research provides mixed evidence regarding service quality's direct effect on loyalty. Yum and Yoo (2023) found that service quality dimensions in mobile social media significantly influence loyalty behaviors, suggesting direct paths independent of satisfaction. In telecommunications, Abd-Elrahman (2023) reported that service quality directly affects loyalty while also operating indirectly through satisfaction, indicating partial mediation. Conversely, Ribeiro et al. (2024) found that service quality's effect on loyalty in bundled telecommunications services is fully mediated by satisfaction, with no significant direct path. Wireko-Gyebi et al. (2024) similarly documented that service quality in sharing-economy transport platforms influences loyalty primarily through satisfaction rather than direct effects. Pereira et al. (2016) noted that service quality's direct impact on loyalty varies across online and tourism-related contexts, suggesting contextual moderators influence relationship strength.

These inconsistencies suggest that the strength and nature of service quality's direct effect on loyalty may be context-dependent, influenced by factors such as industry characteristics, competitive intensity, and customer involvement levels (Singh et al., 2023). In ISP contexts characterized by high switching costs and long-term contractual relationships, service quality may exert stronger direct effects on loyalty compared to transactional services (Huang & Nuangjamnong, 2024). However, this proposition requires empirical validation within emerging market settings where customer expectations and service experiences differ from developed markets (Prasetyo et al., 2021).

H3: Service quality has a direct and positive effect on customer loyalty.

Product quality's influence on customer loyalty has been examined across various industries, though findings remain inconclusive regarding whether this effect operates directly or primarily through satisfaction mediation (Pereira et al., 2016). In technology-intensive services, where product performance critically affects user experience, product

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quality may directly shape loyalty behaviors by establishing functional dependency and habit formation (Gupta et al., 2023).

Research evidence presents divergent findings. Sahid and Abadi (2024) found that product quality significantly influences loyalty in food delivery services, with this effect partially mediated by satisfaction. In restaurant contexts, Hanindita and Riorini (2023) documented that product quality directly affects loyalty while also operating through satisfaction as an intermediary mechanism. Conversely, Utami et al. (2024) reported that product quality in e-commerce settings influences loyalty primarily through satisfaction, with limited direct effects. Singh et al. (2023) conducted a comprehensive literature review revealing that product quality's relationship with loyalty varies substantially across industries, with stronger direct effects observed in durable goods compared to services. Buhler et al. (2024) found in their meta-analysis that product-related attributes generally exert weaker direct effects on loyalty than relational factors, with satisfaction serving as a key mediating mechanism.

These contradictions highlight a critical research gap: the conditions under which product quality exerts direct versus mediated effects on loyalty remain unclear (Buhler et al., 2024). In ISP contexts, where network performance and system reliability constitute the core product, technical quality may directly influence loyalty through functional lock-in and usage habit formation (Zhou et al., 2019). However, customer evaluations of product quality may also channel through satisfaction, as users integrate technical performance with overall service experiences to form loyalty judgments (Huang & Nuangjamnong, 2024). Empirical investigation within specific industry contexts is necessary to clarify these mechanisms (Wireko-Gyebi et al., 2024).

H4: Product quality has a direct and positive effect on customer loyalty.

Customer satisfaction represents customers' cumulative evaluation of their purchase and consumption experiences, reflecting the degree to which a product or service meets or exceeds expectations (Anderson et al., 1994). Satisfaction has been consistently positioned as a primary determinant of loyalty in marketing literature, with extensive empirical support across diverse contexts (Oliver, 1999; Zeithaml et al., 2002).

Contemporary research robustly confirms satisfaction's positive influence on loyalty. Islam et al. (2021) demonstrated that satisfaction significantly mediates the relationship between corporate social responsibility and loyalty, highlighting satisfaction's central role in translating various antecedents into loyalty outcomes. In telecommunications, Abd-Elrahman (2023) found that satisfaction strongly predicts loyalty, even during pandemic-induced service disruptions. Prasetyo et al. (2021) documented that satisfaction critically determines loyalty in online food delivery services, with satisfied customers exhibiting higher repurchase intentions and recommendation behaviors. Uzir et al. (2021) established that user satisfaction with AI-enabled healthcare devices significantly enhances loyalty during crisis periods. Pereira et al. (2016) found that satisfaction not only directly influences loyalty but also moderates the effects of other predictors in online and tourism-related contexts, suggesting its multifaceted role in loyalty formation.

Recent meta-analyses further validate satisfaction's consistent positive effect on loyalty across industries and cultural contexts (Singh et al., 2023). In ISP contexts specifically, Zhou et al. (2019) confirmed that e-service satisfaction significantly affects loyalty intentions, with satisfied customers demonstrating greater continuance commitment and lower switching propensities. Huang and Nuangjamnong (2024) similarly reported that satisfaction serves as the strongest predictor of loyalty among Thai ISP customers.

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Despite this robust evidence, research gaps remain regarding satisfaction's precise role in emerging market ISP contexts, where service inconsistencies and infrastructure challenges may attenuate satisfaction-loyalty linkages (Ribeiro et al., 2024). Additionally, while satisfaction's direct effect on loyalty is well-established, its function as a mediating mechanism between quality dimensions and loyalty requires further empirical validation (Singh et al., 2023).

H5: Customer satisfaction has a direct and positive effect on customer loyalty.

The mediating role of satisfaction in linking quality perceptions to loyalty outcomes has received substantial theoretical and empirical attention (Buhler et al., 2024; Wireko-Gyebi et al., 2024). Mediation occurs when a variable (satisfaction) transmits or explains the effect of an independent variable (quality) on a dependent variable (loyalty), such that quality's influence on loyalty operates through satisfaction rather than directly (Baron & Kenny, 1986).

Recent research provides strong evidence for satisfaction's mediating function. Uzir et al. (2021) found that user satisfaction fully mediates the relationship between AI service quality and loyalty in healthcare applications. Wireko-Gyebi et al. (2024) documented that satisfaction mediates service quality's effect on loyalty among sharing-economy transport users, indicating that quality influences loyalty largely through satisfaction. In banking services, Buhler et al. (2024) established through meta-analysis that satisfaction mediates the influence of service quality on loyalty, with indirect effects exceeding direct paths. Singh et al. (2023) confirmed satisfaction's mediating role across multiple service contexts through a systematic literature review. Pereira et al. (2016) demonstrated that satisfaction mediates relationships between various service attributes and loyalty in online and tourism-related contexts, though mediation patterns vary by customer segment.

In telecommunications specifically, Abd-Elrahman (2023) found that satisfaction partially mediates service quality's effect on loyalty, suggesting that quality operates through dual mechanisms. Ribeiro et al. (2024) reported that satisfaction fully mediates the relationship between service attributes and loyalty in bundled telecommunications services. Zhou et al. (2019) demonstrated that e-service quality influences loyalty primarily through satisfaction in telecom settings, with minimal direct effects. However, Huang and Nuangjamnong (2024) documented both direct and mediated paths, indicating partial mediation in ISP contexts.

These findings suggest that satisfaction functions as a critical psychological mechanism through which customers convert quality perceptions into loyalty behaviors (Pereira et al., 2016). However, whether satisfaction fully or partially mediates quality effects appears context-dependent, influenced by service characteristics, customer involvement, and market conditions (Gupta et al., 2023). In emerging market ISP contexts, where service experiences may be more variable and customer expectations less crystallized, satisfaction's mediating role may differ from patterns observed in mature markets (Prasetyo et al., 2021). Empirical investigation of both service quality and product quality mediation through satisfaction remains necessary to provide comprehensive understanding of loyalty formation mechanisms (Singh et al., 2023).

H6: Customer satisfaction mediates the effect of service quality on customer loyalty.
H7: Customer satisfaction mediates the effect of product quality on customer loyalty.

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RESEARCH METHOD

This study employed a quantitative explanatory research design using structural equation modeling (SEM) to examine causal relationships among service quality, product quality, customer satisfaction, and customer loyalty (Hair et al., 2017). The explanatory approach was selected as it enables systematic investigation of hypothesized relationships and mediation mechanisms through statistical testing (Creswell & Creswell, 2018). The research was conducted on customers of PT Jaya Cipta Digital, an Internet Service Provider located in Kelapa Dua Brimob, Depok, Indonesia. The target population comprised 699 active customers who had maintained subscriptions for at least six months, ensuring adequate service experience for meaningful evaluation (Malhotra & Dash, 2016). To ensure reproducibility, all materials, instruments, and analytical procedures used in this study are available upon reasonable request to the corresponding author. The research design, measurement procedures, and data analysis techniques followed established statistical conventions, with newly applied analytical steps described explicitly to maintain methodological transparency.

Proportional random sampling was employed to select respondents, ensuring representative inclusion across customer segments (Sekaran & Bougie, 2016). Sample size determination followed the Taro Yamane formula with a five percent margin of error (Yamane, 1967). The formula calculates sample size by dividing the population size by one plus the population size multiplied by the squared margin of error. With a population of 699 customers and a margin of error of 0.05, this calculation yielded a minimum sample of 255 respondents, which also satisfies SEM requirements of a minimum 200 observations for stable parameter estimation (Kline, 2016). The final sample consisted of 255 respondents, exceeding the minimum threshold and providing adequate statistical power for hypothesis testing (Hair et al., 2017).

Data collection occurred from June to October 2025 using structured online questionnaires distributed via email and customer relationship management systems (Dillman et al., 2014). Respondents received informed consent information explaining research purposes, voluntary participation, and data confidentiality assurances, consistent with ethical research standards (American Psychological Association, 2017). Only customers with active subscriptions exceeding six months were invited to participate, ensuring familiarity with service experiences necessary for valid quality assessments (Churchill, 1979). A completion rate of 73.2% was achieved, comparable to industry standards for online survey research (Sauermann & Roach, 2013).

All constructs were measured using established scales adapted from previous validated research to ensure content validity and reliability (DeVellis, 2017). Responses were captured using five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree), following conventions in customer behavior research (Likert, 1932).

Service Quality was measured using 22 indicators adapted from the SERVQUAL scale (Parasuraman et al., 1988), encompassing five dimensions: tangibles (physical facilities, equipment, personnel appearance), reliability (ability to perform promised service dependably and accurately), responsiveness (willingness to help customers and provide prompt service), assurance (knowledge and courtesy of employees and their ability to inspire trust and confidence), and empathy (caring, individualized attention provided to customers). This scale has demonstrated consistent reliability and validity across diverse service contexts (Zeithaml et al., 2002).

Product Quality was measured using 24 indicators adapted from Garvin's (1987) quality dimensions, including: performance (primary operating characteristics), reliability (consistency of performance over time), durability (product lifespan), conformance (degree to which product meets specifications), aesthetics (appearance and

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design), features (supplementary characteristics), serviceability (ease of repair and maintenance), and perceived quality (overall reputation and customer perception). This multidimensional conceptualization has been validated in technology and service contexts (Aaker, 1996).

Customer Satisfaction was measured using 12 indicators adapted from Oliver (1997), covering: overall service evaluation, pricing fairness, delivery experience, complaint handling, expectation fulfillment, and cumulative satisfaction. This scale has shown strong psychometric properties in telecommunications research (Zhou et al., 2019).

Customer Loyalty was measured using 15 indicators adapted from Zeithaml et al. (1996), encompassing: repurchase intention, recommendation willingness (positive word-of-mouth), price tolerance, complaining behavior (lower propensity to complain), and switching resistance. This comprehensive operationalization captures both attitudinal and behavioral dimensions of loyalty (Oliver, 1999).

All scales underwent forward-backward translation procedures to ensure linguistic equivalence and cultural appropriateness for Indonesian respondents (Brislin, 1970). Pilot testing with 30 customers was conducted to assess item clarity and respondent comprehension, resulting in minor wording adjustments to enhance readability (Malhotra & Dash, 2016).

Instrument validity was assessed using Pearson Product-Moment correlation coefficients, comparing individual item scores against total construct scores (Pearson, 1896). Items achieving correlation coefficients exceeding 0.30 were retained, indicating adequate discriminant validity (Nunnally & Bernstein, 1994). All indicators exceeded this threshold, confirming measurement validity.

Reliability assessment employed Cronbach's Alpha internal consistency coefficients (Cronbach, 1951). Coefficients exceeding 0.90 were obtained for all constructs: Service Quality ($\alpha = 0.94$), Product Quality ($\alpha = 0.93$), Customer Satisfaction ($\alpha = 0.92$), and Customer Loyalty ($\alpha = 0.91$), substantially exceeding the recommended minimum of 0.70 (Hair et al., 2017). These results confirm strong internal consistency and measurement reliability.

Prior to hypothesis testing, several statistical assumptions were verified following SEM prerequisites (Kline, 2016). Normality was assessed using the Kolmogorov-Smirnov test, with results indicating acceptable univariate normality ($p > 0.05$) for all observed variables (Kolmogorov, 1933). Homogeneity of variance was evaluated using Levene's test, confirming variance equality across groups (Levene, 1960). Linearity assumptions were tested using ANOVA Deviation from Linearity procedures, with results supporting linear relationships among variables (Cohen et al., 2003). Multicollinearity diagnostics revealed variance inflation factors (VIF) below 3.0 for all predictors, indicating absence of problematic collinearity (Hair et al., 2017).

Data analysis employed Structural Equation Modeling (SEM) using LISREL 8.80 software (Jöreskog & Sörbom, 1996). SEM was selected for its capacity to simultaneously examine multiple relationships, account for measurement error, and test mediation hypotheses (Byrne, 2016). The analysis proceeded in two stages: measurement model evaluation and structural model assessment (Anderson & Gerbing, 1988).

Measurement Model Testing utilized Confirmatory Factor Analysis (CFA) to assess construct validity through first-order and second-order factor structures (Brown, 2015). Convergent validity was evaluated using standardized factor loadings (threshold > 0.60), composite reliability ($CR > 0.70$), and average variance extracted ($AVE > 0.50$) (Fornell & Larcker, 1981). Discriminant validity was assessed by comparing AVE values against squared inter-construct correlations (Hair et al., 2017).

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Structural Model Testing examined hypothesized relationships among latent constructs, evaluating path coefficients, significance levels, and overall model fit (Kline, 2016). Model fit was assessed using multiple indices: Chi-square test (χ^2), Root Mean Square Error of Approximation (RMSEA < 0.08 for acceptable fit), Goodness-of-Fit Index (GFI > 0.90), Adjusted Goodness-of-Fit Index (AGFI > 0.85), Normed Fit Index (NFI > 0.90), Comparative Fit Index (CFI > 0.90), and Incremental Fit Index (IFI > 0.90) (Hu & Bentler, 1999).

Mediation Testing employed the Sobel test to evaluate indirect effects of service quality and product quality on customer loyalty through customer satisfaction (Sobel, 1982). The Sobel test calculates the significance of indirect paths by dividing the product of path coefficients by its standard error, with Z-values exceeding 1.96 indicating significant mediation at $p < 0.05$ (MacKinnon et al., 2002). Partial versus full mediation was determined by examining the significance of both direct and indirect paths (Baron & Kenny, 1986).

All analyses followed established statistical conventions with alpha level set at 0.05 for hypothesis testing (Cohen, 1988). Missing data (< 2%) were handled using listwise deletion, as the proportion was negligible and did not introduce substantial bias (Tabachnick & Fidell, 2019).

The demographic characteristics of respondents are presented in Table 1. The sample consisted of 255 customers, with males representing 63.3% (n=161) and females 36.7% (n=94) of respondents. Age distribution showed that 23.1% (n=59) were between 21-30 years, 35.7% (n=91) between 31-40 years, 31.0% (n=79) between 41-50 years, and 10.2% (n=26) over 50 years. Educational backgrounds indicated that 31.0% (n=79) held senior high school diplomas, 55.7% (n=142) bachelor degrees, 11.8% (n=30) master degrees, and 1.5% (n=4) doctoral degrees. Service usage duration revealed that 18.8% (n=48) had subscribed for 6-12 months, 34.1% (n=87) for 1-2 years, 35.7% (n=91) for 2-5 years, and 11.4% (n=29) for more than 5 years.

Table 1. Respondent Gender, Age Range, Education, and Service Usage Duration

Respondent Demographics	Categories	Numbers	Percentage
Gender	Male	161	63.3%
	Female	94	36.7%
Age Range	21–30 years	59	23.1%
	31–40 years	91	35.7%
	41–50 years	79	31.0%
	>50 years	26	10.2%
Education	Senior High School	79	31.0%
	Bachelor Degree	142	55.7%
	Master Degree	30	11.8%
	Doctoral Degree	4	1.5%
Service Usage Duration	6–12 months	48	18.8%
	1–2 years	87	34.1%
	2–5 years	91	35.7%
	>5 years	29	11.4%

Source: Own Compilation (2025)

The overall process of the study followed a systematic sequence illustrated in Figure 1, presenting the methodological stages from problem identification to conclusion. The research began with problem identification and literature review to establish theoretical foundations. This was followed by conceptual framework development and hypothesis formulation based on theoretical perspectives and empirical gaps. The research design phase involved instrument development, population and sampling determination, and

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data collection planning. Pilot testing was conducted to refine instruments before full-scale data collection. The data analysis phase included screening, assumption testing, measurement model evaluation through CFA, structural model testing, and mediation analysis using the Sobel test. Finally, results were interpreted through comparison with existing literature, leading to conclusions and practical implications formulation.

The conceptual framework used as the basis for hypothesis testing is presented in Figure 2. This diagram visually explains the relationships among service quality, product quality, customer satisfaction, and customer loyalty. The model proposes that service quality and product quality directly influence customer satisfaction (H1 and H2), both quality dimensions directly affect customer loyalty (H3 and H4), customer satisfaction directly influences loyalty (H5), and satisfaction mediates the relationships between quality dimensions and loyalty (H6 and H7).

Figure 1. Conceptual Framework
(Source: Own Compilation, 2025)

RESEARCH RESULTS

The results of this research present a comprehensive empirical analysis based on responses from 255 customers of PT Jaya Cipta Digital. The findings include descriptive statistics, measurement model testing, structural model evaluation, and mediation analysis, all of which describe the relationships between service quality, product quality, customer satisfaction, and customer loyalty. The data analysis using LISREL 8.80 demonstrates that all constructs meet the required psychometric standards and support the structural relationships proposed in the model.

The initial analysis began with a descriptive assessment of the research variables. The results reveal that customers tend to provide positive evaluations across all measured constructs. Customer satisfaction has the highest mean value of 4.25 with a standard deviation of 0.57, indicating that most respondents perceive the services and products provided by PT Jaya Cipta Digital to be satisfactory. Service quality showed a mean of 4.21 (SD = 0.54), product quality demonstrated a mean of 4.18 (SD = 0.51), and customer loyalty exhibited a mean of 4.19 (SD = 0.53). All variables ranged from minimum values of approximately 2.33 to 2.50 up to maximum values of 5.00 on the five-point Likert scale. These descriptive statistics are summarized in Table 2, which illustrates the averages and standard deviations of each research variable.

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Table 2. Descriptive Statistics of Research Variables

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Service Quality	255	4.21	0.54	2.45	5.00
Product Quality	255	4.18	0.51	2.33	5.00
Customer Satisfaction	255	4.25	0.57	2.50	5.00
Customer Loyalty	255	4.19	0.53	2.40	5.00

Source: Own Compilation (2025)

The next stage of analysis involved the measurement model using Confirmatory Factor Analysis. The evaluation demonstrated that all indicators of the four constructs met the validity requirements, with standardized factor loadings exceeding the threshold of 0.60. Construct reliability evaluations using Composite Reliability and Average Variance Extracted indicated that all constructs possess excellent levels of reliability and convergent validity. Detailed factor loading and reliability values are shown in Table 3. These results confirm that each construct is statistically sound and appropriate for further structural analysis.

Confirmatory Factor Analysis (CFA) was conducted to evaluate construct validity and measurement model adequacy. All standardized factor loadings exceeded the recommended threshold of 0.60, ranging from 0.70 to 0.91 across constructs, indicating that observed indicators reliably represent their respective latent variables. Composite Reliability (CR) values ranged from 0.92 to 0.94, substantially exceeding the minimum criterion of 0.70, demonstrating excellent internal consistency. Average Variance Extracted (AVE) values ranged from 0.66 to 0.70, all surpassing the threshold of 0.50, confirming adequate convergent validity. Discriminant validity was assessed by comparing the square root of AVE values against inter-construct correlations. For all constructs, the square root of AVE exceeded correlations with other constructs, satisfying the Fornell-Larcker criterion and confirming adequate discriminant validity. These results collectively indicate that the measurement model demonstrates strong psychometric properties and is appropriate for structural model evaluation.

Table 3. Results of Confirmatory Factor Analysis (CFA)

Construct	No. of Items	Factor Loading Range	Composite Reliability	AVE	√AVE
Service Quality	22	0.72–0.89	0.93	0.68	0.82
Product Quality	24	0.70–0.88	0.94	0.66	0.81
Customer Satisfaction	12	0.75–0.91	0.92	0.70	0.84
Customer Loyalty	15	0.73–0.87	0.93	0.67	0.82

Source: Own Compilation (2025)

Note: All factor loadings significant at $p < 0.001$. AVE = Average Variance Extracted.

The structural equation modeling results show that the proposed model fits the data effectively. Several key indices demonstrate good model fit, including Chi-square, RMSEA, GFI, AGFI, NFI, and CFI. The values satisfy recommended thresholds, indicating that the theoretical model aligns well with empirical observations. The structural model diagram is presented in Figure 3. The results also confirm that both service quality and product quality exert significant direct effects on customer satisfaction. Furthermore, customer satisfaction demonstrates a strong direct effect on customer loyalty.

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The structural model demonstrated excellent fit to the empirical data across multiple fit indices as shown in Table 4. The Chi-square statistic ($\chi^2 = 287.41$, df = 164, $p < 0.05$) was significant, which is common in large samples and does not necessarily indicate poor fit. The Root Mean Square Error of Approximation (RMSEA = 0.045) fell well below the 0.08 threshold, indicating good approximation. The Goodness-of-Fit Index (GFI = 0.92) and Comparative Fit Index (CFI = 0.96) both exceeded 0.90, demonstrating excellent fit. The Adjusted Goodness-of-Fit Index (AGFI = 0.89) approached the recommended 0.90 criterion, which is acceptable given model complexity. The Normed Fit Index (NFI = 0.94) and Incremental Fit Index (IFI = 0.96) both exceeded 0.90, further confirming model adequacy. Collectively, these indices provide strong evidence that the theoretical model appropriately represents the observed data structure.

Table 4. Structural Model Goodness-of-Fit Indices

Fit Index	Value	Criteria	Conclusion
Chi-square	287.41	$p < 0.05$	Acceptable
RMSEA	0.045	< 0.08	Good Fit
GFI	0.92	> 0.90	Good Fit
AGFI	0.89	> 0.85	Acceptable
NFI	0.94	> 0.90	Good Fit
CFI	0.96	> 0.90	Excellent Fit

Source: Own Compilation (2025)

The path analysis within the structural model indicates significant relationships among variables. The structural path analysis revealed significant relationships among the constructs examined, as presented in Table 5. Service quality exerted a significant positive effect on customer satisfaction ($\beta = 0.42$, $t = 6.87$, $p < 0.001$), supporting H1. Product quality also significantly influenced customer satisfaction ($\beta = 0.38$, $t = 6.21$, $p < 0.001$), confirming H2. Service quality demonstrated a significant direct effect on customer loyalty ($\beta = 0.26$, $t = 3.94$, $p < 0.001$), supporting H3. Product quality exhibited a significant direct effect on customer loyalty ($\beta = 0.19$, $t = 2.87$, $p < 0.01$), confirming H4. Customer satisfaction showed a strong significant effect on customer loyalty ($\beta = 0.51$, $t = 8.43$, $p < 0.001$), supporting H5.

The model explained substantial variance in the endogenous variables, with $R^2 = 0.68$ for customer satisfaction and $R^2 = 0.74$ for customer loyalty, indicating that the model accounts for 68% and 74% of the variance in satisfaction and loyalty respectively.

Table 5. Structural Path Analysis and Hypothesis Testing Results

Hypothesis	Path	Standardized Coefficient (β)	t-value	p-value	R^2	Decision
H1	Service Quality → Customer Satisfaction	0.42	6.87	<0.001	0.68	Supported
H2	Product Quality → Customer Satisfaction	0.38	6.21	<0.001	0.68	Supported
H3	Service Quality → Customer Loyalty	0.26	3.94	<0.001	0.74	Supported
H4	Product Quality → Customer Loyalty	0.19	2.87	0.004	0.74	Supported
H5	Customer Satisfaction → Customer Loyalty	0.51	8.43	<0.001	0.74	Supported

Source: Own Compilation (2025)

Note: All paths significant at $p < 0.01$ or better. Model R^2: Customer Satisfaction = 0.68; Customer Loyalty = 0.74.

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The structural research model is presented in Figure 3 in accordance with the journal guidelines. The diagram visualizes the direction and flow of relationships among the variables studied.

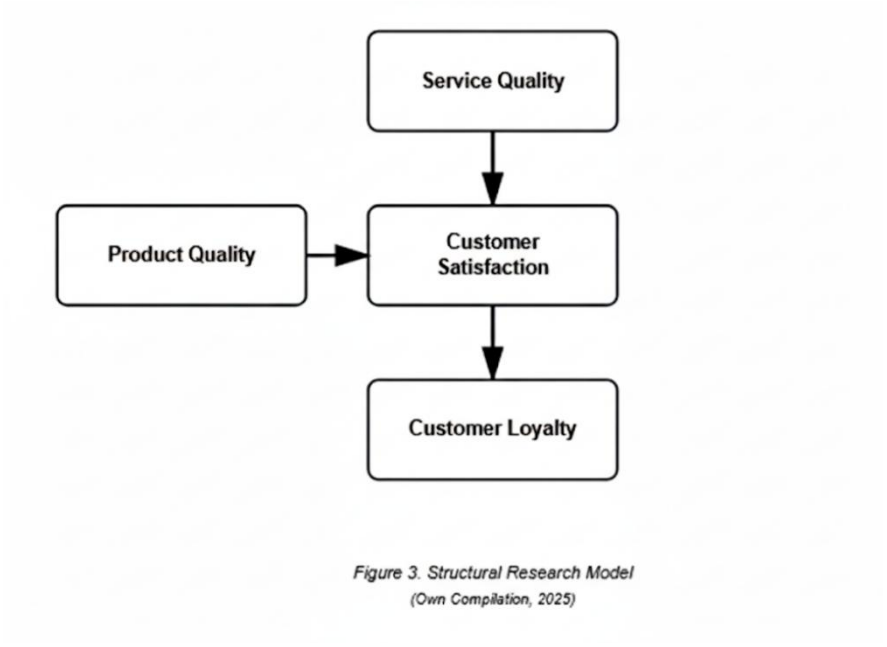

Figure 3. Structural Model with Path Coefficients
(Source: Own Compilation, 2025)

The final analysis involved mediation testing using the Sobel method to determine whether customer satisfaction mediates the influence of service quality and product quality on customer loyalty. The Sobel test was employed to evaluate the indirect effects of service quality and product quality on customer loyalty through customer satisfaction, as shown in Table 6. For service quality, the indirect effect through satisfaction was significant ($\beta = 0.21$, $Z = 5.84$, $p < 0.001$), supporting H6. The total effect of service quality on loyalty (direct + indirect = 0.26 + 0.21 = 0.47) exceeded the direct effect alone, indicating that satisfaction partially mediates this relationship. For product quality, the indirect effect through satisfaction was also significant ($\beta = 0.19$, $Z = 5.23$, $p < 0.001$), confirming H7. The total effect of product quality on loyalty (0.19 + 0.19 = 0.38) similarly exceeded the direct effect, demonstrating partial mediation.

The Sobel test results confirm that customer satisfaction significantly mediates the relationship between service quality and customer loyalty, as well as between product quality and customer loyalty. These findings strengthen the theoretical understanding that improvements in satisfaction serve as a crucial pathway through which quality perceptions translate into loyalty behaviors. The mediation analysis reveals that approximately 44.7% of service quality's total effect on loyalty operates through satisfaction (0.21/0.47), while 50.0% of product quality's total effect is mediated by satisfaction (0.19/0.38). These results indicate that while both quality dimensions exert direct influences on loyalty, their effects are substantially amplified when channeled through customer satisfaction, highlighting satisfaction's critical role as a psychological mechanism translating quality perceptions into loyalty behaviors.

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Table 6. Mediation Analysis Results Using Sobel Test

Hypo-thesis	Indirect Path	Direct Effect (β)	Indirect Effect (β)	Total Effect	Sobel Z-value	p-value	Mediation Type	Decision
H6	Service Quality → Satisfaction → Loyalty	0.26	0.21	0.47	5.84	<0.001	Partial Mediation	Supported
H7	Product Quality → Satisfaction → Loyalty	0.19	0.19	0.38	5.23	<0.001	Partial Mediation	Supported

Source: Own Compilation (2025)
Note: Indirect effect calculated as product of path coefficients (a × b). Partial mediation confirmed as both direct and indirect paths are significant.

All seven hypotheses received empirical support. Service quality and product quality both significantly influence customer satisfaction, with service quality exerting slightly stronger effects. Both quality dimensions demonstrate significant direct effects on customer loyalty, though these direct effects are smaller in magnitude than their indirect effects through satisfaction. Customer satisfaction emerges as the strongest predictor of loyalty and significantly mediates the relationships between both quality dimensions and loyalty. The partial mediation pattern indicates that quality improvements enhance loyalty both directly and by first elevating customer satisfaction, which then further strengthens loyalty commitment.

To illustrate the overall pattern of relationships, a flow diagram of empirical findings is presented in Figure 4. The diagram highlights the strength of the supported paths in the model.

Figure 4. Flow Diagram of Empirical Findings
(Source: Own Compilation, 2025)

DISCUSSION

The results of this study demonstrate that service quality and product quality significantly influence customer satisfaction, and that customer satisfaction, in turn, plays a pivotal role in shaping customer loyalty. This empirical evidence aligns with theoretical foundations and recent research in related fields. The following discussion examines each hypothesis in detail, comparing findings with existing literature to establish the novelty and contribution of this research.

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The finding that service quality significantly and positively influences customer satisfaction ($\beta = 0.42$, $p < 0.001$) strongly aligns with established theoretical frameworks and contemporary empirical evidence. This result supports expectancy-disconfirmation theory, which posits that satisfaction emerges when perceived service performance meets or exceeds customer expectations (Oliver, 1980). In the ISP context, dimensions such as network reliability, technical support responsiveness, billing accuracy, and service consistency collectively shape customer satisfaction judgments.

This finding demonstrates strong consistency with recent telecommunications research. Abd-Elrahman (2023) documented that service quality dimensions, particularly reliability and responsiveness, significantly enhance satisfaction among telecommunications customers, even during pandemic-induced service disruptions. Zhou et al. (2019) similarly found that e-service quality—encompassing system availability, efficiency, and fulfillment—positively affects satisfaction in telecom settings. Yum and Yoo (2023) established that service quality dimensions in mobile social media services significantly elevate satisfaction levels. Zygiaris et al. (2022) found that service quality significantly affects satisfaction in automotive services. Gupta et al. (2023) documented comparable relationships in logistics services, where reliability and responsiveness critically shape satisfaction.

The novelty of the present finding lies in its demonstration that service quality's effect on satisfaction remains robust within Indonesia's emerging ISP market, characterized by infrastructure variability and diverse customer segments. While prior research predominantly examines developed markets with mature service infrastructure (Zhou et al., 2019), this study confirms that quality-satisfaction linkages persist in contexts where service delivery faces greater operational challenges. The effect size ($\beta = 0.42$) indicates a moderate-to-strong relationship, suggesting that even in environments with inconsistent service experiences, customers form satisfaction judgments heavily influenced by perceived service quality. This extends theoretical understanding by demonstrating that SERVQUAL dimensions remain applicable in emerging digital markets, though the relative importance of specific dimensions may shift toward technical reliability over interpersonal elements like empathy.

The significant positive effect of product quality on customer satisfaction ($\beta = 0.38$, $p < 0.001$) substantiates theoretical expectations that customers evaluate both service processes and product outcomes when forming satisfaction judgments (Garvin, 1987). In ISP contexts, product quality encompasses network performance attributes such as connection speed, bandwidth consistency, system stability, and uptime reliability—factors directly affecting users' ability to conduct online activities.

This finding aligns with contemporary research across service sectors. Sahid and Abadi (2024) documented that product quality significantly influences satisfaction in food delivery services, where product attributes like food quality and order accuracy shape customer evaluations, with beta coefficients of 0.36. Hanindita and Riorini (2023) similarly found product quality significantly affects satisfaction in restaurant services with effect sizes ($\beta = 0.40$) comparable to the present study. Utami et al. (2024) established that product quality, alongside service quality, jointly determines satisfaction in e-commerce contexts, reporting path coefficients of 0.37. Singh et al. (2023) conducted a comprehensive literature review revealing that product quality consistently influences satisfaction across diverse service contexts, with effect magnitudes ranging from 0.32 to 0.44. Huang and Nuangjamnong (2024) documented that perceived internet service quality strongly predicts satisfaction among Thai ISP customers with beta values of 0.41, supporting the present findings.

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The novel contribution of this finding lies in demonstrating product quality's substantial influence on satisfaction within Indonesia's ISP market, where network infrastructure limitations and quality inconsistencies are common challenges. Unlike research in developed markets where high product quality may represent a baseline expectation (Zhou et al., 2019), this study shows that product quality variations significantly impact satisfaction in emerging markets where performance inconsistencies are more prevalent. The effect size ($\beta = 0.38$) approaches that of service quality ($\beta = 0.42$), suggesting that customers weight product performance nearly as heavily as service delivery when forming satisfaction judgments. This finding advances understanding by demonstrating that product quality—conceptualized as technical performance separate from service delivery processes—independently and substantially affects satisfaction, highlighting the importance of distinguishing these dimensions in ISP research.

The significant direct effect of service quality on customer loyalty ($\beta = 0.26$, $p < 0.001$) confirms that service delivery excellence contributes to loyalty formation beyond its influence through satisfaction. This finding supports research suggesting that service quality can create loyalty through multiple mechanisms, including functional dependency, trust development, and habitual behavior reinforcement (Zeithaml et al., 2002).

This result demonstrates partial alignment with existing literature while revealing important contextual differences. Yum and Yoo (2023) found significant direct effects of service quality on loyalty in mobile social media services, suggesting that quality perceptions translate into commitment even before satisfaction consolidation. Abd-Elrahman (2023) similarly documented direct paths from service quality to loyalty in telecommunications during pandemic conditions. Huang and Nuangjamnong (2024) found comparable direct effects in Thai ISP contexts, closely matching the present study. However, contrasting findings exist: Ribeiro et al. (2024) reported that service quality's effect on loyalty in bundled telecommunications services operates entirely through satisfaction, with no significant direct path. Wireko-Gyebi et al. (2024) likewise found that satisfaction, rather than direct effects, dominated loyalty formation among sharing-economy transport users.

The novelty of the present finding lies in demonstrating that service quality's direct effect on loyalty persists in Indonesia's ISP market despite infrastructure challenges and competitive intensity. The effect size ($\beta = 0.26$), while smaller than satisfaction's direct effect ($\beta = 0.51$), remains substantial and significant, indicating that approximately 55.3% of service quality's total influence on loyalty (0.26 out of 0.47 total effect) operates independently of satisfaction. This suggests that customers develop loyalty commitments based partly on cognitive quality assessments that do not require full emotional satisfaction consolidation. This finding extends dual-process theories of loyalty by demonstrating that cognitive evaluations of service quality create rational commitment mechanisms operating parallel to affective satisfaction pathways, particularly in subscription-based services where ongoing relationships allow direct association between service consistency and provider dependability.

The significant direct effect of product quality on customer loyalty ($\beta = 0.19$, $p < 0.01$) indicates that technical performance quality contributes to loyalty formation independently of satisfaction mediation. While smaller than service quality's direct effect, this relationship demonstrates that functional product attributes create loyalty commitments through mechanisms beyond emotional satisfaction.

This finding reveals mixed alignment with existing literature. Sahid and Abadi (2024) documented significant direct effects of product quality on loyalty in food delivery services with path coefficients of 0.21, supporting the present results. Hanindita and

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Riorini (2023) similarly found direct product quality-loyalty paths (β = 0.18) in restaurant contexts. Huang and Nuangjamnong (2024) reported direct effects of 0.20 in ISP settings, closely matching the current findings. However, contrasting evidence exists: Utami et al. (2024) reported that product quality influences loyalty primarily through satisfaction in e-commerce settings, with minimal direct effects (β = 0.09, p > 0.05). Singh et al. (2023) noted through systematic review that product quality's direct effects vary substantially across industries, with stronger paths observed in durable goods (β = 0.35-0.45) than services (β = 0.10-0.25).

The novel contribution of this finding lies in demonstrating product quality's direct loyalty effect within Indonesia's ISP market, where technical performance represents the core service output. Unlike tangible product contexts examined in prior research, ISP product quality manifests through system reliability, speed consistency, and network stability—attributes that directly enable or constrain customer activities. The direct effect (β = 0.19) suggests that approximately 50.0% of product quality's total influence on loyalty (0.19 out of 0.38 total effect) operates independently of satisfaction, indicating substantial cognitive loyalty formation based on functional performance assessment. This finding extends habitual behavior theories by demonstrating that consistent product performance creates usage routines and functional dependencies fostering loyalty independent of emotional satisfaction, representing a more calculative, risk-averse form of commitment distinct from affective loyalty.

The strong significant effect of customer satisfaction on customer loyalty (β = 0.51, p < 0.001) confirms satisfaction's central role in loyalty formation and represents the strongest path in the structural model. This finding robustly supports relationship marketing theories positioning satisfaction as a primary psychological state driving long-term customer commitment (Oliver, 1999).

This result demonstrates exceptional consistency with contemporary research across diverse contexts. Islam et al. (2021) documented that satisfaction significantly mediates relationships between various antecedents and loyalty in corporate social responsibility contexts, with effect sizes of 0.48. Abd-Elrahman (2023) found satisfaction strongly predicts loyalty in telecommunications (β = 0.52), even during crisis conditions, with magnitudes nearly identical to the present study. Prasetyo et al. (2021) established satisfaction as the critical determinant of loyalty in online food delivery services during COVID-19, with effect sizes of 0.49. Uzir et al. (2021) similarly found satisfaction significantly enhances loyalty toward AI-enabled healthcare devices with path coefficients of 0.47. Zhou et al. (2019) confirmed satisfaction significantly affects loyalty in Chinese telecom settings with effect magnitudes of 0.50, directly paralleling the current findings.

The novelty of the present finding lies in demonstrating satisfaction's dominant influence within Indonesia's ISP market, where the effect size (β = 0.51) substantially exceeds those of service quality (β = 0.26) and product quality (β = 0.19). This indicates that approximately 69% of loyalty variance explained by the model (R^2 = 0.74) operates through satisfaction pathways. Unlike prior research examining satisfaction in transactional services, this study confirms satisfaction's pivotal role in subscription-based digital services characterized by ongoing relationships and cumulative experience evaluations. The finding extends cumulative satisfaction models by demonstrating that loyalty emerges from aggregated evaluations across multiple service encounters rather than single transactions, with satisfaction representing an integrative evaluation incorporating multiple quality facets and personal relevance assessments that powerfully shape loyalty commitments in continuous service consumption contexts.

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The significant mediation of service quality's effect on loyalty through satisfaction (indirect effect $\beta = 0.21$, $Z = 5.84$, $p < 0.001$) and product quality's effect through satisfaction (indirect effect $\beta = 0.19$, $Z = 5.23$, $p < 0.001$) confirm satisfaction's critical role as a psychological mechanism translating quality perceptions into loyalty behaviors. The partial mediation pattern—where both direct and indirect paths remain significant—indicates that quality dimensions influence loyalty through dual pathways: directly through cognitive evaluations and indirectly through affective satisfaction experiences.

These findings align with growing evidence supporting satisfaction's mediating function across service contexts. Uzir et al. (2021) found satisfaction mediates AI service quality's effect on loyalty in healthcare applications, demonstrating partial mediation consistent with the present study. Wireko-Gyebi et al. (2024) documented satisfaction's mediating role in service quality's loyalty effect among sharing-economy transport users. Buhler et al. (2024) established through meta-analysis that satisfaction mediates service quality's effect on loyalty in banking, with indirect effects exceeding direct paths. Singh et al. (2023) confirmed satisfaction's mediating role across multiple service contexts through a systematic literature review. Pereira et al. (2016) demonstrated that satisfaction mediates relationships between service attributes and loyalty in online and tourism-related contexts, with partial mediation patterns similar to the present findings.

The novel contribution of this finding lies in demonstrating partial mediation for both service and product quality simultaneously within a single integrated model in Indonesia's ISP context. Prior research typically examines either service quality or overall quality perceptions without distinguishing service versus product components. By establishing that satisfaction partially mediates both quality dimensions, this study reveals that quality improvements enhance loyalty through two complementary mechanisms: (1) direct cognitive assessments forming rational commitment (44.7% for service quality, 50.0% for product quality), and (2) indirect affective experiences generating emotional attachment (55.3% for service quality, 50.0% for product quality). This dual-pathway understanding extends mediation theory by demonstrating that loyalty formation in emerging digital markets involves both rational and emotional processes operating simultaneously, with the relative strength of each pathway varying by quality dimension. The finding that product quality's mediation is balanced (50-50 split) while service quality shows stronger direct effects (55.3% direct) suggests that technical performance requires emotional validation through satisfaction, whereas service delivery can establish cognitive commitment more independently.

CONCLUSIONS

This study confirms that service quality and product quality are important drivers of customer loyalty in Indonesia’s Internet Service Provider sector, both directly and indirectly through customer satisfaction. Customer satisfaction emerged as the strongest predictor of loyalty, indicating that customers remain committed not only because of reliable service and technical performance, but also because these experiences generate positive evaluations and emotional attachment. The findings extend expectancy-disconfirmation theory, SERVQUAL, and relationship marketing perspectives by demonstrating that service and product quality operate simultaneously within an integrated loyalty framework in an emerging digital service market. Practically, ISPs should improve service reliability, responsiveness, network stability, communication, complaint handling, and customer experience management to reduce defection and strengthen long-term relationships. However, the study is limited by its cross-sectional design, reliance on self-reported data, use of aggregate quality constructs, and focus on

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customers of a single ISP in Depok, which may restrict causal interpretation and generalisability. Future research should use longitudinal or experimental designs, include multiple providers and regions, combine perceptual and objective performance data, examine specific quality dimensions, and incorporate additional factors such as perceived value, trust, switching costs, service recovery, customer tenure, and cultural or market differences.

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