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## FROM SERVICE TO TRUST: INVESTIGATING THE ROLE OF E-SATISFACTION IN MEDIATING CUSTOMER SERVICE AND EFFICIENCY ON E-TRUST

**Abstract:** *This study examines the relationships between customer service, efficiency, electronic satisfaction, and electronic trust in digital marketplaces, focusing on 326 respondents using purposive sampling and analyzed with Partial Least Squares Structural Equation Modeling. The findings indicate that customer service and efficiency significantly enhance satisfaction, which in turn positively influences trust. Satisfaction also mediates the relationships between customer service, efficiency, and trust, highlighting its critical role in building consumer confidence. These results emphasize the importance of responsive customer support and efficient platform design in fostering satisfaction and trust. Businesses should invest in improving service quality, user-friendly interfaces, and secure transaction systems to enhance customer experiences and loyalty. This study provides insights into trust-building mechanisms in digital marketplaces and offers recommendations for businesses and policymakers to promote customer satisfaction and trust in competitive and evolving digital environments.*

**Keywords:** *customer service, digital marketplaces, efficiency, electronic satisfaction, electronic trust*

### 1. Introduction

The rapid growth of e-commerce has transformed the global business landscape, providing consumers with unprecedented access to products and services. In Indonesia, one of Southeast Asia's largest digital markets, the adoption of online marketplaces has surged significantly, driven by increasing internet penetration and mobile technology usage. E-commerce has emerged as a transformative force in driving economic growth and enhancing business productivity, particularly in emerging markets like

Indonesia. Indonesia is projected to experience the highest e-commerce growth rate globally by 2024, with trade values anticipated to reach 78% of the total retail trade, highlighting its substantial role in the country's economic development (Anggraeni et al., 2024). This rapid expansion not only facilitates access to broader markets but also enhances productivity, particularly for small and medium enterprises (SMEs), by providing digital tools, increasing visibility, and fostering innovation and operational efficiency. E-commerce allows SMEs to overcome traditional barriers such as high

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operational costs and geographic limitations, enabling them to compete effectively with larger firms. However, while e-commerce stimulates regional economic growth and creates opportunities for employment and entrepreneurship, it may inadvertently exacerbate economic inequalities due to existing infrastructure disparities and uneven digital literacy levels across regions (Rahmadani et al., 2024). With rising consumer expectations, online businesses face mounting pressure to enhance service quality, particularly in areas of customer service and efficiency, to maintain competitiveness. Customer service refers to the ability of e-commerce platforms to respond to queries, resolve complaints, and ensure customer satisfaction throughout the online shopping process. Efficiency, on the other hand, reflects how seamlessly and promptly customers can complete transactions, including navigation, product search, and timely delivery. Both factors are critical to achieving e-satisfaction, defined as the fulfillment of consumer expectations in an online shopping environment. E-Satisfaction plays a critical role in positively influencing E-Trust within e-commerce environments by enhancing consumers' confidence in the platform's reliability and integrity. This trust is particularly essential in online transactions where physical interaction is absent, and users rely heavily on perceived transparency and consistent service quality. Studies have demonstrated that higher levels of e-satisfaction significantly strengthen e-trust, fostering greater consumer loyalty by ensuring safe transactions and protecting user privacy (Haryono et al., 2024; Margaretha et al., 2024). Furthermore, consumer satisfaction directly contributes to trust formation, which serves as a foundation for long-term loyalty and repeated engagement with e-commerce platforms, highlighting the importance of maintaining service reliability and integrity (Kim & Yum, 2024).

Despite significant research on e-commerce service quality, little is known about the mediating role of e-satisfaction in the

relationship between customer service, efficiency, and e-trust, especially in emerging markets like Indonesia. Customer service and efficiency are widely acknowledged as pivotal drivers of consumer satisfaction, yet their indirect effects on trust remain underexplored (Kim & Yum, 2024). Prior studies emphasize that satisfaction serves as a mediator, linking service quality to trust and subsequent behavioral outcomes like loyalty and repurchase intention (Iqbal et al., 2023). However, limited research focuses on these relationships in developing economies, where trust is essential for mitigating uncertainties in online transactions.

As trust is critical for ensuring customer retention and loyalty, understanding this dynamic relationship becomes essential for e-commerce platforms to optimize their services and build long-term customer relationships (Purnamasari & Suryandari, 2023). This study addresses the gap by exploring how customer service and efficiency influence e-satisfaction and, subsequently, e-trust.

The objectives of this research are to examine the direct impact of customer service and efficiency on e-satisfaction, investigate the effect of e-satisfaction on e-trust, and analyze the mediating role of e-satisfaction in the relationship between customer service, efficiency, and e-trust. The study aligns with existing literature, which highlights that e-satisfaction is a key mediator in explaining customer trust and behavioral intentions in online marketplaces (Silviana & Puspaningrum, 2022).

The findings of this research hold significant implications for both academia and the business sector. Academically, this study contributes to the body of knowledge on service quality and its impact on consumer satisfaction and trust within e-commerce contexts, particularly in emerging markets like Indonesia. The study provides a deeper understanding of how e-satisfaction functions as a mediating variable in influencing e-trust, offering insights for future research. From a

managerial perspective, the study helps e-commerce platforms identify key service elements—customer service and efficiency—that enhance customer satisfaction and trust. By understanding these relationships, businesses can formulate strategies to improve customer experiences, increase loyalty, and maintain competitive advantage in a fast-paced digital economy (Susanto et al., 2021).

## **2. Literature Review**

### **2.1. Customer Service and E-Satisfaction**

Customer service can be defined as the series of activities and interactions between a business and its customers that aim to enhance customer satisfaction by meeting or exceeding their expectations. It encompasses various aspects, including responsiveness, reliability, and effective communication, to ensure that customers feel valued and supported throughout their journey with a business. Effective customer service not only addresses immediate concerns but also builds long-term relationships by fostering trust and loyalty (Rahul & Esha, 2015). It is recognized as a critical competitive advantage in many industries, as it directly impacts customer retention and satisfaction by aligning service delivery with customer needs and expectations (dos Santos et al., 2022). Additionally, in digital and traditional settings, customer service quality is often linked to a company's overall reputation and success, as it represents the organization's commitment to meeting customer demands effectively (Madanchian et al., 2022).

Electronic Service Quality (E-Service Quality) and Customer Service (CS) are pivotal in shaping Electronic Customer Satisfaction (E-Satisfaction), fostering customer loyalty, and driving the success of e-commerce platforms across various industries. Enhanced e-service quality, characterized by dimensions such as responsiveness, reliability, ease of use, efficiency, security, and transaction usability,

significantly impacts e-satisfaction and customer loyalty on platforms like Tokopedia (Yapinski et al., 2024). Studies utilizing e-SERVQUAL dimensions further emphasize the role of responsiveness and reliability in directly shaping customer service in online shopping environments, contributing to overall satisfaction with products and services (Salleh et al., 2024). In industries like retail, banking (Sundaram et al., 2017), and telecom (Zhou et al., 2019), these factors significantly enhance consumer satisfaction, which subsequently strengthens trust and loyalty. Furthermore, in the restaurant industry and cross-border e-commerce, improved system responsiveness and secure transactions are critical for achieving high levels of e-satisfaction and retaining loyal customers (Gunawan et al., 2024). Effective customer service in digital transactions fosters trust by ensuring secure and reliable interactions, promoting long-term loyalty (Iqbal et al., 2023). Additionally, research highlights that e-satisfaction serves as a mediator, linking service quality to enhanced customer trust and loyalty, particularly in emerging markets (Taherdoost & Madanchian, 2021). Collectively, these findings underscore the vital role of e-service quality and customer service in shaping satisfaction, trust, and loyalty, ensuring success in the competitive e-commerce landscape.

*H1: Customer service positively influences E-satisfaction.*

### **2.2 Efficiency and E-Satisfaction**

Çelik, K. (2021) defines efficiency as the simplicity of use and speed of site connectivity. According to Parasuraman et al. 2005, efficiency relates to a digital marketplace's information content, design, updates, and ease of use. Moreover, the internet's power and time are the main reasons people shop online. In this regard, the website's speed and usability are crucial factors in evaluating the quality of e-services.

Efficiency is a critical determinant of E-Satisfaction (ES) in e-commerce, as it ensures smooth and prompt service delivery throughout the customer journey. Efficiency refers to the ease of navigating websites, quick transaction completion, and seamless service availability. Research demonstrates that efficient systems significantly enhance user experiences, fostering customer satisfaction and encouraging loyalty. Key dimensions of efficiency, such as system responsiveness, transaction accuracy, and reliability, directly impact customer satisfaction in various e-commerce contexts (Mayasari & Audina, 2020). Additionally, efficient delivery systems and cost-effective processes contribute to positive perceptions, improving satisfaction and the willingness to repurchase (Saha et al., 2020). In e-banking services, efficiency plays a pivotal role in enhancing customer satisfaction by providing accurate, secure, and user-friendly experiences. The integration of data-driven approaches and digital transformation enables banks to analyze customer behavior through advanced analytics, allowing for personalized service offerings that significantly enhance the user experience (Adeniran et al., 2024). Digital banking reduces transaction times, providing customers with the convenience and speed necessary for satisfaction, while enhanced security measures, such as real-time fraud detection, build trust and ensure the safety of financial information (Adeniran et al., 2024; Chu & Zhan, 2024). Additionally, tailored services that cater to customer preferences further improve satisfaction by addressing individual needs, while user-friendly interfaces focus on ease of use, making digital platforms more accessible and enjoyable for customers (Tomar, 2024). Moreover, in educational services, efficiency as part of electronic service quality (e-SQ) has been highlighted as a key factor influencing satisfaction and loyalty (Sudrajat et al., 2020). Collectively, these findings emphasize the importance of efficiency in enhancing e-satisfaction, making it a priority for businesses seeking to optimize customer

experiences in competitive digital markets.  
*H2: Efficiency significantly and positively influences E-Satisfaction.*

### 2.3 E-Satisfaction and E-Trust

E-Satisfaction is broadly defined as the degree of customer contentment derived from interactions with electronic services and platforms, influenced by various quality dimensions. It encompasses users' overall satisfaction with online shopping experiences, shaped by factors such as reliability, responsiveness, and assurance (Nasution et al., 2019). Security, usability, and system performance are also critical components that contribute to meeting customer expectations and enhancing satisfaction (Tariq, 2020; Patipol et al., 2024). Moreover, E-Satisfaction is influenced by system reliability, website design, and service responsiveness, which collectively foster a positive user experience (Sumi & Kabir, 2021). Transaction efficiency and user-friendly interfaces also play a vital role in enhancing E-Satisfaction, ensuring that users have seamless and reliable interactions with e-commerce platforms (Mayasari & Audina, 2020). Additionally, system responsiveness, ease of use, and transaction security are key drivers of satisfaction, creating a foundation for customer loyalty and trust (Gunawan et al., 2024).

E-Satisfaction plays a crucial role in shaping E-Trust in e-commerce environments, as satisfaction positively influences customers' confidence in a platform's reliability, security, and ability to meet expectations. Studies demonstrate that E-Satisfaction mediates the relationship between E-Service Quality and E-Trust, highlighting that dimensions such as efficiency, privacy, and customer service significantly impact trust-building (Al-Dweeri et al., 2017). Trust, in turn, is found to enhance customer satisfaction and loyalty by ensuring consistent and secure digital transactions (Kundu & Datta, 2015). E-Satisfaction also acts as an intervening variable between information security,

privacy, and trust, with higher satisfaction levels reinforcing customer confidence in platforms (Girsang et al., 2020). Moreover, findings confirm that fulfillment and privacy significantly influence both E-Satisfaction and E-Trust, demonstrating a direct link between satisfied users and their willingness to trust online platforms (Leonnard, 2019). Collectively, these insights underline the intertwined nature of satisfaction and trust in driving loyalty and sustainable consumer relationships in the digital economy.

*H3: E-satisfaction significantly and positively influences E-trust.*

#### 2.4 Mediating Role of E-Satisfaction on the Relationship between Customer Service and E-Trust

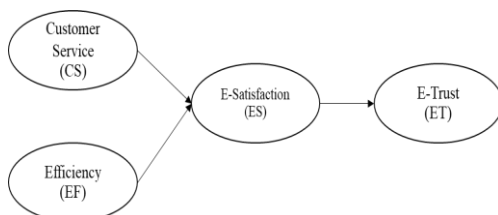
The mediating role of E-Satisfaction in the relationship between Customer Service and E-Trust has been extensively explored in recent research. Studies indicate that E-Satisfaction serves as a crucial intermediary that links the quality of customer service to the development of trust in e-commerce platforms. For instance, Al-Dweeri et al. (2017) demonstrated that dimensions of E-Service Quality, including customer service, positively influence E-Satisfaction, which in turn mediates and enhances E-Trust (Al-Dweeri et al., 2017). Similarly, Kundu and Datta (2015) highlight that effective customer service enhances trust by building satisfaction through consistent and high-quality service delivery (Kundu & Datta, 2015). Further, Iqbal et al. (2023) emphasize that service quality elements such as responsiveness and reliability contribute to customer satisfaction, which plays a mediating role in trust-building (Iqbal et al., 2023). Additionally, Suleman et al. (2022) confirm the significant mediating role of E-Satisfaction, noting that it strengthens the impact of customer service on trust and loyalty (Suleman et al., 2022).

*H4: E-satisfaction mediates the relationship between customer service and E-trust.*

#### 2.5 Mediating Role of E-Satisfaction on the Relationship between Efficiency and E-Trust

The mediating role of E-Satisfaction in the relationship between Efficiency and E-Trust highlights its importance in fostering trust in online platforms. Efficiency, encompassing ease of use, timely service delivery, and system reliability, significantly influences E-Satisfaction, which in turn builds E-Trust. Studies confirm that E-Satisfaction acts as a critical intermediary, linking service quality attributes such as efficiency to enhanced trust. For instance, efficient service delivery improves satisfaction by meeting customer expectations, which subsequently fosters trust in the platform's reliability and transparency (Al-Dweeri et al., 2017). Additionally, E-Satisfaction derived from efficient systems and processes directly influences customer confidence in the platform's capability to protect data and ensure secure transactions, reinforcing E-Trust (Leonnard, 2019). In higher education e-services, efficient service delivery significantly enhances satisfaction, which mediates the trust-building process and encourages loyalty (Suleman et al., 2022). Similarly, in digital banking, efficiency-driven satisfaction positively influences E-Trust by ensuring seamless and reliable customer experiences (Purnamasari & Suryandari, 2023). These findings underscore the essential role of E-Satisfaction as a mediator that strengthens the impact of efficiency on E-Trust in various digital service contexts.

*H5: E-satisfaction mediates the relationship between efficiency and E-trust.*



**Figure 1.** Conceptual Framework

Based on the literature review, the conceptual framework for this study is developed and presented in Figure 1.

### **3. Methods**

#### **3.1. Participants**

The participants of this study consisted of 326 respondents who met the inclusion criteria: domiciled in Indonesia, male or female, aged 18 years or older, and having made purchases in online marketplaces within the past three months. A non-probability purposive sampling technique was employed to select participants who aligned with the study's objectives, acknowledging potential selection biases inherent in this method, such as self-selection bias and non-representativeness of the sample (Lehdonvirta et al., 2020). Data collection was conducted over two months using a structured questionnaire. The majority of respondents were female (66.3%), with most (65%) aged between 17 and 25 years. Regarding purchase frequency in the past month, 60.1% reported making 2–3 transactions. Most respondents were students (55.2%), and their highest level of education was predominantly vocational or high school (53.7%), followed by bachelor's degree holders (32.2%). Common biases in non-probability online surveys, such as selection and response biases, may influence the generalizability of findings, necessitating careful interpretation of the results (Hammon & Zinn, 2024).

#### **3.2. Measures**

This study utilized a structured questionnaire to measure the constructs of Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET). Each construct was operationalized using multiple reflective items on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The reliability of each construct was evaluated using Cronbach's Alpha, ensuring internal consistency. Customer Service (CS)

was measured using five items, assessing respondents' perceptions of the marketplace's readiness, willingness to help, problem-solving interest, and post-transaction service quality. This construct achieved a Cronbach's Alpha of 0.972, indicating excellent reliability. Efficiency (EF) was evaluated through five items addressing the ease of use, organization, and transaction speed of the digital marketplace, with a Cronbach's Alpha of 0.778, signifying acceptable reliability. E-Satisfaction (ES) was measured using four items focusing on overall satisfaction, decision satisfaction, and shopping experiences, yielding a Cronbach's Alpha of 0.814, indicative of good reliability. E-Trust (ET) was assessed using three items related to trust in the marketplace's product reliability, claims, and app functionality, achieving a Cronbach's Alpha of 0.674, slightly below the commonly accepted threshold but still indicative of moderate reliability for exploratory research (Hair et al., 2019). The Cronbach's Alpha values suggest that the measurement items were reliable for assessing the constructs, supporting their use in the PLS-SEM analysis. Each construct's items were adapted from prior validated scales to ensure content validity and alignment with the study's context.

#### **3.3. Data Collection**

The data for this study were collected through an online survey, a method recognized for its cost-effectiveness and ability to gather data from a broad participant base within a short period. The survey was distributed over two months and utilized structured questionnaires designed to capture demographic and behavioral information related to e-commerce platform usage. This approach aligns with best practices in online survey methodologies, enabling efficient data collection while minimizing logistical challenges associated with traditional survey methods (Rowen et al., 2019). Non-probability sampling with purposive criteria was employed to ensure that respondents met

the study's eligibility requirements, including being domiciled in Indonesia, aged 18 or older, and having made online purchases in the past three months. While online surveys allow for quick and flexible data collection, researchers acknowledge potential biases, such as nonresponse and selection bias, which could influence the representativeness of the sample (Loomis & Paterson, 2018). Despite these limitations, online surveys remain a reliable tool for collecting high-quality data when methodological precautions are observed (Fricker, 2015).

### **3.4. Data Analysis**

The data for this study were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS, a method chosen for its effectiveness in handling complex models and small to medium sample sizes. PLS-SEM enables the simultaneous evaluation of measurement and structural models, making it particularly suitable for exploratory research and prediction-oriented studies (Sarstedt & Cheah, 2019). The analysis began with the assessment of the measurement model, focusing on indicator reliability, composite reliability, convergent validity, and discriminant validity, ensuring robust measurement properties. Next, the structural model was evaluated using path coefficients,  $R^2$  values,  $Q^2$  predictive relevance, and effect sizes to determine the relationships between constructs and the model's explanatory power (Memon et al., 2021). Bootstrapping with 5,000 subsamples was employed to test the significance of hypothesized paths, ensuring reliable statistical inference (Matthews, 2018). Mediation analysis was conducted to explore the indirect effects of customer service and efficiency on E-Trust through E-Satisfaction, highlighting the framework's predictive relevance. This comprehensive approach ensured a detailed and accurate understanding of the relationships among the study variables (Subhaktiyasa, 2024).

### **3.5. Ethical Considerations**

This study adhered to established ethical guidelines to ensure the integrity and protection of respondents throughout the research process. Participants provided informed consent before completing the survey, which outlined the study's purpose, their voluntary participation, and their right to withdraw at any time. Privacy and confidentiality were maintained by anonymizing all responses and securely storing data to prevent unauthorized access. These measures align with ethical standards for online surveys, emphasizing the importance of transparency, participant autonomy, and data protection (Roberts & Allen, 2015). To minimize risks associated with online data collection, such as breaches of confidentiality, appropriate digital safeguards were implemented, including encrypted storage and restricted access to the dataset (Hammer, 2017). Additionally, the study was conducted in accordance with institutional and national ethical review board guidelines, ensuring compliance with broader research ethics frameworks (Struminskaya & Sakshaug, 2023). These efforts collectively uphold the ethical principles of respect, beneficence, and justice in digital research contexts.

## **4. Results**

### **4.1 Assessment of the SmartPLS SEM Outer Model**

The evaluation of the outer model in SmartPLS involves a thorough examination to ensure the reliability and validity of the research measures. This process includes several key components. Indicator reliability is assessed by reviewing item loadings, with values of 0.7 or higher deemed acceptable (Henseler et al., 2009). Construct reliability is determined using Cronbach's Alpha and Composite Reliability (CR), where thresholds of 0.7 or greater indicate adequate internal consistency (Hair et al., 2017). Convergent

validity is evaluated by calculating the Average Variance Extracted (AVE), with a minimum acceptable value of 0.5, signifying that the construct explains more than 50% of the variance in its indicators (Fornell & Larcker, 1981). Discriminant validity, which ensures that constructs are distinct from one another, is tested using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. HTMT values below 0.9 confirm adequate discriminant validity (Henseler et al., 2015). Cross-loadings are

examined to verify that indicators load more strongly on their respective constructs than on others. Additionally, collinearity is checked using the Variance Inflation Factor (VIF), where values of 5 or less are considered acceptable to avoid multicollinearity issues (Hair et al., 2017). By systematically applying these assessments, the outer model is rigorously validated, ensuring the robustness and reliability of the measurement model for subsequent analysis of structural relationships within the SEM framework.

**Table 1.** Measurement model assessments

Item	Loadings	VIF	$\alpha$	rho_a	rho_c	AVE
Customer Service (CS)			0.792	0.794	0.792	0.433
CS1	0.670	1.457				
CS2	0.710	1.577				
CS3	0.666	1.634				
CS4	0.604	1.529				
CS5	0.636	1.433				
Efficiency (EF)			0.788	0.780	0.778	0.413
EF1	0.703	1.618				
EF2	0.609	1.503				
EF3	0.639	1.377				
EF4	0.630	1.510				
EF5	0.630	1.410				
E-Satisfaction (ES)			0.814	0.815	0.814	0.522
ES1	0.731	1.640				
ES2	0.757	1.744				
ES3	0.680	1.717				
ES4	0.721	1.599				
E-Trust (ET)			0.676	0.678	0.673	0.408
ET1	0.658	1.358				
ET2	0.563	1.370				
ET3	0.689	1.247				

Table 1 provides an overview of the measurement model assessments for the constructs of Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET). The table evaluates the reliability, validity, and multicollinearity of the items. Indicator loadings for each item reflect their contribution to the construct, with values above 0.6 generally considered acceptable for exploratory research (Hair et al., 2017). However, some items, such as CS4 (0.604) and ET2 (0.563), fall slightly below the ideal threshold of 0.7, indicating weaker

relationships with their respective constructs but still acceptable for preliminary analyses (Henseler et al., 2009). The Variance Inflation Factor (VIF) values, all below 5, confirm that multicollinearity is not a concern (Fornell & Larcker, 1981). Reliability measures, including Cronbach's Alpha ( $\alpha$ ) and Composite Reliability (rho\_c), meet the minimum threshold of 0.7 for CS, EF, and ES, while ET has a slightly lower alpha (0.676), indicating moderate reliability for this construct (Hair et al., 2017). The Average Variance Extracted (AVE) values range from

0.408 to 0.522, suggesting adequate convergent validity for ES but lower validity for the other constructs, which indicates the need for potential refinement of some items.

Overall, the table highlights acceptable measurement properties, with some areas requiring improvement for a more robust model.

**Table 2.** Cross loadings

	CS	EF	ES	ET
CS1	0.670	0.620	0.554	0.581
CS2	0.710	0.454	0.587	0.501
CS3	0.666	0.487	0.551	0.461
CS4	0.604	0.477	0.500	0.472
CS5	0.636	0.486	0.526	0.520
EF1	0.537	0.703	0.565	0.522
EF2	0.528	0.609	0.489	0.492
EF3	0.468	0.639	0.514	0.360
EF4	0.451	0.630	0.507	0.433
EF5	0.478	0.630	0.506	0.503
ES1	0.598	0.598	0.731	0.477
ES2	0.611	0.641	0.757	0.484
ES3	0.580	0.528	0.680	0.445
ES4	0.602	0.552	0.721	0.490
ET1	0.461	0.487	0.432	0.658
ET2	0.489	0.507	0.369	0.563
ET3	0.530	0.400	0.452	0.689

Table 2 presents the cross-loadings of the indicators for the constructs Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET), providing insights into discriminant validity. Cross-loadings are analyzed to confirm that each indicator loads higher on its assigned construct compared to others, which is essential for establishing that constructs are distinct (Henseler et al., 2015). For instance, CS1 loads highest on its intended construct, CS (0.670), compared to EF (0.620), ES (0.554), and ET (0.581), supporting its discriminant validity. Similarly, EF1 shows the highest loading on EF (0.703), confirming its alignment with the

intended construct. Most indicators follow this pattern, indicating good discriminant validity for the model (Hair et al., 2017). However, some cross-loadings, such as ES1 (0.598 on CS and EF), approach the primary loading on ES (0.731), suggesting minor overlap that warrants attention. This finding underscores the need for further refinement of specific indicators to ensure clearer distinctions between constructs (Fornell & Larcker, 1981). Overall, the table demonstrates acceptable discriminant validity, but minor indicator overlaps should be addressed for optimal measurement quality.

**Table 3.** Discriminant validity calculations

	AVEs Scores				HTMT Scores			
	1	2	3	4	1	2	3	4
1-CS	<b>0.658</b>							
2-EF	0.766	<b>0.643</b>			0.768			
3-ES	0.827	0.804	<b>0.723</b>		0.826	0.802		
4-ET	0.770	0.719	0.656	<b>0.639</b>	0.770	0.726	0.653	

Note: bold values are squared AVE values.

Table 3 assesses the discriminant validity of the constructs Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET) using two criteria: the Average Variance Extracted (AVE) and the Heterotrait-Monotrait (HTMT) ratio. The diagonal bolded values represent the squared AVE scores, which should be higher than the inter-construct correlations in the corresponding rows and columns to meet the Fornell-Larcker criterion for discriminant validity (Fornell & Larcker, 1981). For example, the AVE squared value for CS (0.658) is greater than its correlations with EF (0.643), ES (0.804), and ET (0.770), supporting discriminant validity. Similarly, EF (0.766) and ES (0.827) also meet this criterion. The HTMT values, used to assess the strength of discriminant validity, should be below 0.90 to confirm distinct constructs (Henseler et al., 2015). All HTMT values in the table are below this threshold, with the highest being 0.826 between CS and ES, indicating adequate discriminant validity. Overall, the results confirm that the constructs in the model are distinct from one another and meet the necessary validity criteria for structural equation modeling (Hair et al., 2017).

#### 4.2 Structural Model Evaluation

The structural model's proposed relationships were rigorously tested using bootstrapping, a powerful statistical method ideal for in-depth analysis. This approach involves creating numerous subsamples (with replacement) from the original dataset to assess its variability and robustness. Each subsample is utilized to estimate the parameters of a Partial Least Squares (PLS) path model, and by repeating this process approximately 5,000 times, the reliability of the parameter estimates is verified. This ensures that the results accurately reflect the underlying data structure rather than being specific to a single sample. One significant advantage of bootstrapping is its ability to compute standard errors, which are crucial for

calculating t-values, p-values, and confidence intervals—key metrics for determining the significance of relationships in PLS-SEM. This method provides a robust quantitative foundation for hypothesis evaluation. The findings are comprehensively presented in Tables 4-5 and Figure 2, offering both visual and tabular insights. These results validate the hypothesized relationships, confirming the reliability and significance of the model's core connections (Hair et al., 2021).

**Table 4.** Model fits

	Saturated model	Estimated model
SRMR	0.046	0.060
d_ULS	0.323	0.553
d_G	0.131	0.151
Chi-square	202.946	231.332
NFI	0.895	0.880

Table 4 evaluates the model fit indices for both the saturated and estimated models in the PLS-SEM analysis, using metrics such as SRMR, d\_ULS, d\_G, Chi-square, and NFI. The Standardized Root Mean Square Residual (SRMR) values, which assess the difference between observed and predicted correlations, are well below the threshold of 0.08 for both models (0.046 for the saturated model and 0.060 for the estimated model), indicating a good model fit (Hair et al., 2021). The d\_ULS (squared Euclidean distance) and d\_G (geodesic distance) values, which further evaluate model fit, are lower in the saturated model, suggesting a better fit compared to the estimated model. The Chi-square statistic, while higher in the estimated model (231.332) than in the saturated model (202.946), remains an informative but less critical measure in PLS-SEM, as it can be sensitive to sample size (Henseler et al., 2015). The Normed Fit Index (NFI), which compares the model's fit to a null model, approaches the acceptable threshold of 0.9, with values of 0.895 and 0.880 for the saturated and estimated models, respectively, indicating an adequate model fit (Hu & Bentler, 1999). Overall, the results suggest

that both models demonstrate a satisfactory fit, with the saturated model showing slightly better indices.

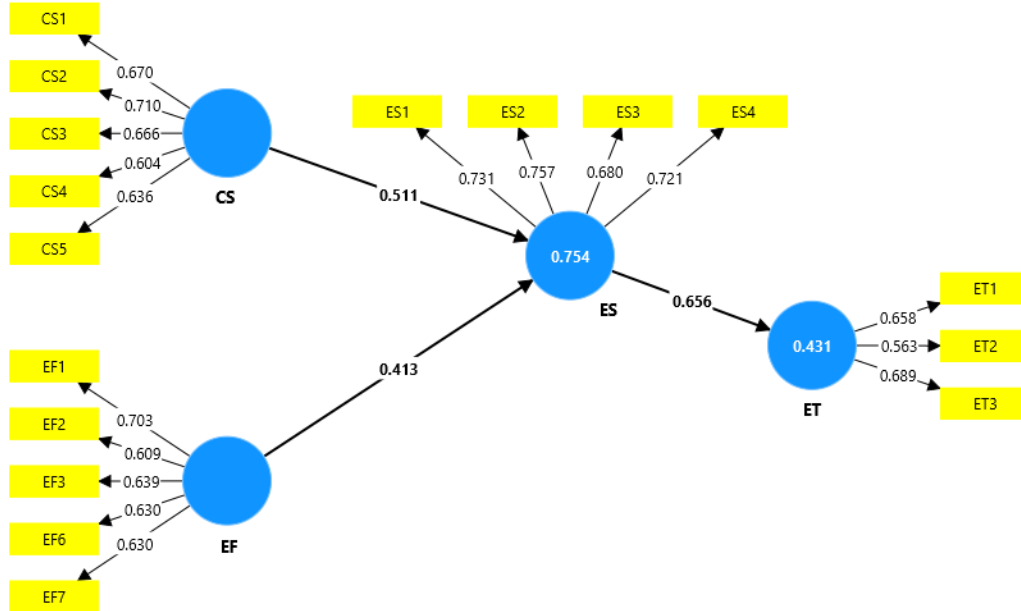


Figure 2. SEM Model

Table 5. Relationship between variables

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t-statistics ( O/STDEV )	p-values
CS -> ES	0.511	0.518	0.114	4.466	0.000
EF -> ES	0.413	0.410	0.120	3.439	0.001
ES -> ET	0.656	0.657	0.090	7.275	0.000
CS -> ES -> ET	0.335	0.340	0.089	3.777	0.000
EF -> ES -> ET	0.271	0.271	0.093	2.907	0.004

Table 5 presents the results of the structural model analysis, illustrating the relationships between Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET). The direct effect of CS on ES is significant, with a path coefficient of 0.511, a t-statistic of 4.466, and a p-value of 0.000, indicating a strong positive relationship. Similarly, EF significantly impacts ES, with a path coefficient of 0.413, a t-statistic of 3.439, and a p-value of 0.001. The direct relationship between ES and ET is the strongest, with a path coefficient of 0.656, a t-statistic of 7.275, and a p-value of 0.000, confirming the critical

role of ES in fostering ET. Additionally, the indirect effects via mediation are also significant. The mediating role of ES in the relationship between CS and ET has a path coefficient of 0.335, a t-statistic of 3.777, and a p-value of 0.000, while for EF and ET, the mediation effect is 0.271 with a t-statistic of 2.907 and a p-value of 0.004. These results highlight that ES is a key mediating factor, amplifying the influence of CS and EF on ET, and all relationships are statistically significant, as indicated by p-values below 0.05 (Hair et al., 2021).

## **5. Discussion**

The results of this study align closely with existing literature, reinforcing the critical relationships between Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET). The positive influence of CS on ES supports previous findings that highlight the role of responsive, reliable, and effective customer service in fostering satisfaction. As noted by dos Santos et al. (2022) and Salleh et al. (2024), customer service quality directly impacts satisfaction, particularly in digital environments where service attributes such as responsiveness and problem resolution are pivotal. These results further validate the assertion that high-quality customer service is essential for meeting or exceeding customer expectations, driving satisfaction, and building trust (Rahul & Esha, 2015). Similarly, the impact of EF on ES corroborates prior studies emphasizing the role of efficiency in enhancing user satisfaction. Efficiency, characterized by ease of navigation, quick transactions, and seamless operations, has been identified as a key determinant of satisfaction in both e-commerce and e-banking contexts (Çelik, 2021; Mayasari & Audina, 2020). The findings align with Parasuraman et al.'s (2005) e-SERVQUAL dimensions, which stress the importance of system usability and timely service delivery in ensuring customer satisfaction. This is consistent with studies by Adeniran et al. (2024) and Chu & Zhan (2024), which illustrate how efficient systems significantly enhance customer perceptions and experiences, ultimately leading to greater satisfaction and loyalty. The relationship between ES and ET aligns with existing literature that underscores the central role of satisfaction in building trust. As demonstrated by Al-Dweeri et al. (2017) and Kundu & Datta (2015), satisfied customers are more likely to trust a platform's reliability, security, and promises. This finding reinforces the idea that satisfaction serves as a foundation for trust, particularly in digital marketplaces where physical

interactions are absent. Moreover, the mediation analysis highlights that ES strengthens the relationship between both CS and ET and EF and ET. These results echo findings from Suleman et al. (2022) and Leonnard (2019), which confirm the mediating role of ES in linking service quality dimensions such as efficiency and customer service to trust. Despite the valuable insights provided by this study, several limitations must be acknowledged. First, the study was conducted within a specific geographical context (Indonesia) and focused on digital marketplaces, which may limit the generalizability of the findings to other regions or industries. Future research could expand the scope to include cross-cultural comparisons or investigate other e-commerce contexts, such as specialized platforms or niche markets. Second, the study relied on a cross-sectional design, capturing data at a single point in time. Longitudinal studies could provide deeper insights into how relationships among CS, EF, ES, and ET evolve over time. Additionally, this study focused on a limited set of variables, excluding other potentially influential factors such as pricing, user interface design, or product quality. Future research could incorporate these dimensions to develop a more comprehensive understanding of satisfaction and trust dynamics. Finally, the reliance on self-reported data may introduce response bias. Employing objective metrics, such as behavioral data or platform analytics, could enhance the robustness of future findings.

## **6. Conclusion**

This study explored the relationships among Customer Service (CS), Efficiency (EF), E-Satisfaction (ES), and E-Trust (ET) in digital marketplaces, providing important insights into how these constructs interact to influence user behavior. The findings confirm that CS and EF significantly enhance ES, which plays a pivotal mediating role in fostering ET. These results highlight

the importance of responsive and reliable customer service, as well as efficient platform design, in driving user satisfaction and trust. CS, characterized by responsiveness, problem resolution, and customer support, directly impacts how customers perceive the platform's reliability. Similarly, EF, defined by ease of use, quick transactions, and system organization, plays a crucial role in meeting customer expectations and enhancing satisfaction. ES, as a mediating factor, amplifies the influence of CS and EF on ET, emphasizing that satisfied customers are more likely to develop trust in the platform, fostering loyalty and long-term engagement. From a practical perspective, businesses operating in digital marketplaces should prioritize customer-centric strategies by enhancing customer service and optimizing platform efficiency. Personalized, reliable, and proactive customer support systems should be developed to address customer needs promptly and effectively, while also ensuring robust post-purchase support to build lasting trust. Platforms must also focus on user-friendly interfaces, seamless navigation, and secure transaction systems to improve customer experiences. Regular updates and data-driven enhancements based on customer feedback can further strengthen

satisfaction and trust. Additionally, continuous monitoring of customer satisfaction through advanced analytics can help identify service gaps, enabling businesses to tailor their offerings to meet evolving consumer expectations. These findings also have important implications for policymakers. Promoting transparency, security, and accountability in digital marketplaces is essential for building consumer confidence in e-commerce platforms, particularly in emerging markets. Policies that encourage secure digital transactions, data protection, and customer rights will further enhance trust and loyalty in the digital economy. Future research should expand on these findings by exploring cross-cultural studies to understand how these relationships vary across different regions and cultural contexts. Longitudinal research designs can provide insights into how satisfaction and trust evolve over time, while the inclusion of additional variables, such as pricing, product quality, and user interface design, can offer a more comprehensive understanding of satisfaction and trust dynamics. By addressing these areas, businesses and policymakers can ensure that digital marketplaces remain competitive, consumer-friendly, and sustainable in the long term.

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