

Analysis of The Influence of Trust on User Satisfaction of Mobile Application E-Commerce Using DeLone and McLean Method

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Abstract—Lazada is a mobile-platform e-commerce site with 100 million downloads. Lazada sells smartphones, tablets, electronics, health and beauty products, men's and women's clothing, and baby and kids' gear online. User satisfaction is crucial to e-commerce success. However, Lazada app users still have many complaints that affect trust and satisfaction. This study adds the trust variable to the DeLone& McLean model to determine user satisfaction on the Lazada mobile app. Lazada users in Pekanbaru City participated in this study. This quantitative study uses online questionnaires and purposive sampling. PLS-SEM was used to analyze 100 respondents' data with SmartPLS 4.0. This study found that Information Quality, Trust, and Use affect user satisfaction, which affects trust. Out of 10 hypotheses, four were rejected: information quality on trust, service quality on user satisfaction, system quality on user satisfaction, and trust on net benefit.

Keywords—E-Commerce, User Satisfaction, Trust, Lazada, DeLone & McLean

I. INTRODUCTION

The development of technology has become a phenomenon that has attracted quite a lot of attention so that technology enables online transactions that facilitate the buying and selling process. E-Commerce according to O'Brien and Marakas is the activity of buying, selling, marketing, and information through various computer networks[1]. Information technology will continue to evolve and become more sophisticated over time. According to Similarweb data on Databoks.katadata, of the five top e-commerce sites in Indonesia, only Shopee and Bilibli experienced an increase in visits throughout last year, precisely in Q1-Q4 2023, while their competitors tended to weaken, such as Lazada which experienced a significant decline. In the same period, the average visit to the Bilibli website increased by 11% (qoq), while Tokopedia decreased by 0.1% (qoq), Lazada decreased by 18.5% (qoq), and Bukalapak decreased by 15.6% (qoq). The e-commerce Lazada sells a range of essentials, including smartphones and tablets; electronics; men's and women's clothing; health and beauty items; and equipment for babies and kids[2]. Currently, the number of users who have downloaded the Lazada application in Indonesia on the PlayStore has reached around 100 million users. Lazada currently still has problems that they have to face. Lazada's poor quality issues have caused disappointment among its consumers. At Lazada itself, there is no guarantee of product quality, apart from LazzMall. Sometimes sellers deliberately provide information or images of products

that do not match the original. As a result, the products offered are different from the products received by consumers. In addition, customer service at the store is rarely attended to, making customers confused when they want to ask something at the store[3].

Because the research data is numerical, this approach is known as quantitative. To acquire data, research instruments are utilized. The acquired data is then statistically evaluated using descriptive or inferential statistics to determine whether the hypothesis is proven or not. The Delone and Mclean model is a model for measuring the success of IS. This model quickly received a response because it is simple, valid, and needed to be a reference in evaluating the success of an IS[4].

Hidayatullah's previous study used the DeLone and McLean model to examine how user experience affects Shopee e-commerce mobile app user satisfaction. User satisfaction is affected by perceived hedonicity and use, but not utilitarianism or information quality. Three of the fifteen hypotheses proved unfounded: service quality and user satisfaction, and perceived utilitarianism and user satisfaction[5].

Al Hattami validates the D&M IS Success Model in Least Developed Countries' banking sector accounting IS. The study found that information quality predicts AIS user satisfaction and system quality and satisfaction affect system utilization. AIS net benefits improve with system use. System and service quality do not affect AIS user satisfaction or system use[6]. Setiadi used the Delone and Mclean framework to examine customer satisfaction and the mobile app's user experience and found that service quality did not affect user happiness. Perceived hedonicity, information quality, and system quality affect user satisfaction and net benefit[7].

II. LITERATURE REVIEW

A. Trust

Online transactions require trust to make consumers feel safe sharing personal and financial information[8]. Consumer trust in e-commerce lies in the popularity of an e-commerce site, because the more people recognize the site, the more confident consumers will feel about making buying and selling transactions on that e-commerce site. Online shoppers are apprehensive because they are unable to touch, feel, or try the things they are buying, which is a major worry when it comes to e-commerce. Depending on how much information is lacking about the goods, consumers may consider uncertainty or a lack of trust to be significant factors when making decisions while making purchases online. As a result, uncertainty is seen as a crucial component of trust and one of the primary obstacles in e-commerce[9].

B. User Satisfaction

User satisfaction is a value of satisfaction felt by users in using goods or services. When a customer is pleased with a product or service, they are more likely to buy it again or use it again in the future[10]. Customer satisfaction is likely to increase if service meets expectations. If service is satisfactory, customers will feel normal. Unexpectedly poor service also disappoints customers. E-commerce user satisfaction depends on how well a customer's expectations and experiences match a merchant's website, purchase, technical support, delivery, or mobile app[11].

C. E-Commerce

E-Commerce refers to the exchange of goods and services between businesses and individuals via the internet. E-commerce has grown in popularity in the twenty-first century as a method of online distance shopping, providing simple access to international markets and transactions at competitive pricing[12]. E-commerce is now a must-have for

any organization or company in order to compete globally. Companies can use e-commerce to expand their operations and reach more consumers.

D. Lazada

Lazada Group, a 2012 Southeast Asian e-commerce startup, has been part of Alibaba Group since 2016 as a pioneering territory for its SEA expansion[13]. Lazada operates in the Philippines, Indonesia, Malaysia, Thailand, Vietnam, and Singapore. The Indonesian Lazada app now has nearly 100 million PlayStore users after the latest update. Lazada sells electronics, cosmetics, home décor, clothing (men's and women's), children's toys, books, home essentials, and more. Promotions like free shipping and other sales are among Lazada's most appealing.

E. DeLone & McLean IS Success Model

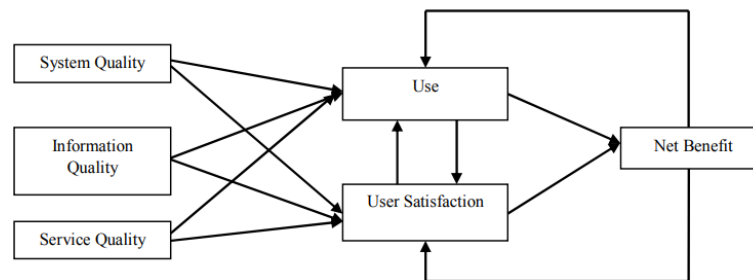


Figure 1. Updated DeLone & McLean IS Success Model (2004)

In 1992, DeLone and McLean identified six variables for IS success. However, these variables do not stand alone but are interdependent. According to Shannon and Weaver's communication theory, which served as the foundation for this paradigm [14] the technical level describes how information may be produced by the system's correctness and efficiency, while the semantic level gauges how well information is delivered. The "Influence" notion was first proposed by Mason [15] Theory of Information which emphasizes the influence of information. From this model, DeLone and McLean created six variables: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. The success model was modified by other IS researchers after DeLone and McLean released it. DeLone and McLean added service quality indicators to their IS success model in 2003 [4], substituting net benefits for organizational and individual impacts. DeLone and McLean modified the IS success model in 2004 to gauge the performance of e-commerce[16]. The model is known as the D&M Measuring E-Commerce Success Model. Figure 1 shows the IS success model for E-Commerce.

III. METHODOLOGY

The four-step methodological methodology for this study is depicted in Figure 2.

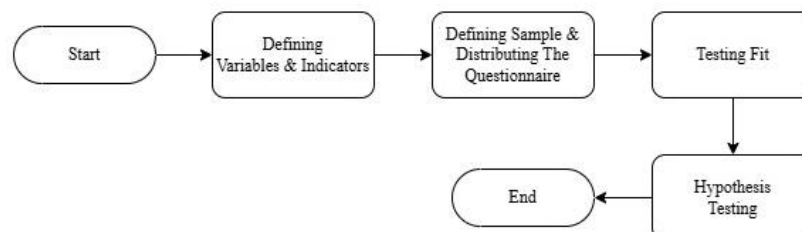


Figure 2. Research Methodology

A. Defining Variables and Indicators

The study's variables and indicators are listed in Table 1.

Table 1. Variables and Indicators of this Study

Variables	Code	Indicators
Information Quality (IQ)	IQ1	Accuracy
	IQ2	Relevance
	IQ3	Timeliness
	IQ4	Understandability
System Quality (SQ)	SQ1	Reliability
	SQ2	Respons Time
	SQ3	Security
	SQ4	Ease of Use
Service Quality (SVQ)	SVQ1	Responsiveness
	SVQ2	Assurance
	SVQ3	Emphaty
Trust (T)	T1	Trustworthy
	T2	Keep Promisses and Agreements
	T3	Confident of Use
User Satisfaction (US)	US1	Site Performance
	US2	Overall Satisfaction
	US3	Inviting Others to Make Purchases Through The App
	US4	Repeat Purchase Intentions
Use (U)	U1	Daily Use
	U2	Intention to Reuse
Net Benefit (NB)	NB1	Time Saving
	NB2	Reduce The Time it Takes to Search for Information
	NB3	Improve Support and Service

The Lazada mobile application was used for this study. Information Quality (IQ), System Quality (SQ), Service Quality (SVQ), Trust (T), User Satisfaction (US), Use (U), and Net Benefit (NB) are the seven variables that make up the IS success model. There are 23 indicators in all, with each variable being broken down into many indicators.

B. Defining Sample and Distributing The Questionnaire

Samples were gathered by the author using the Purposive Sampling technique. The population of respondents in this study was not limited to Lazada application users in the city of Pekanbaru, the sample was drawn using the Lemeshow formula. Due to the target population's size and fluctuating numbers, the researcher employed the Lemeshow formula. In this study, 96 responses was the minimum sample size required, and the researcher would round that number up to 100 respondents. At this point, data was gathered by using Google forms to distribute questionnaires to Lazada users. Likert scales with the following options were used in the questionnaire strongly disagree (SD), disagree (D), neutral (N), agree (A), and strongly agree (SA).

C. Testing Fit

After questionnaires, demographic and statistical data is analyzed. Statistics uses SmartPLS 4 to examine outer (measurement) and inner (structural) models. The extern model evaluates model reliability and validity. Inner model examines variable relationships. AVE, *discriminant validity*, *internal consistency reliability*, and *individual indicator reliability* are checked for the outer model. We test the inner model using these methods: The *t-test* includes *bootstrapping*, *effect size* (f^2), *predictive relevance* (Q^2), *relative impact* (q^2), *coefficient of determination* (R^2), and *path coefficient testing* (β).

D. Hypothesis Testing

The Latent Variable Score (LVS) will be calculated from each variable's outer model. LVS is meant to simplify the model due to low sample numbers. Figures 3 and 4 show how SEM (Structured Equation Modeling) is used to reprocess each variable's LVS value. A path diagram with many dimensions or hypotheses follows the modified DeLone and Mclean IS success model. The author will evaluate and compare all hypotheses (H1-H10) after data analysis. Hypotheses to test are:

- H₁ = Information Quality (IQ) has significant effect on Trust (T)
- H₂ = Information Quality (IQ) has significant effect on User Satisfaction (US)
- H₃ = Service Quality (SVQ) has significant effect on Trust (T)
- H₄ = Service Quality (SVQ) has significant effect on User Satisfaction (US)
- H₅ = System Quality (SQ) has significant influence on Trust (T)
- H₆ = System Quality (SQ) has significant effect on User Satisfaction (US)
- H₇ = Trust (T) has significant effect on Net Benefits (NB)
- H₈ = Trust (T) has significant effect on User Satisfaction (US)
- H₉ = Use (U) has significant effect on User Satisfaction (US)
- H₁₀ = User Satisfaction (US) has significant effect on Net Benefits (NB)

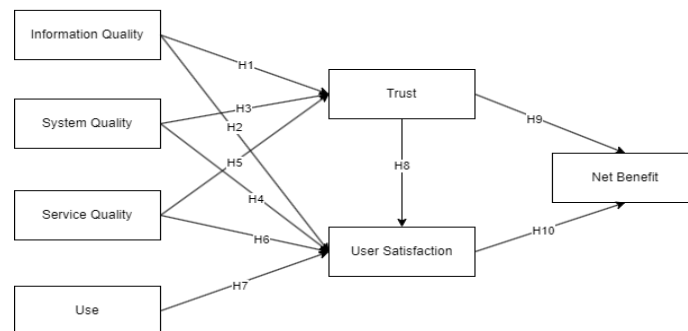


Figure 3. Path Diagram

IV. RESULTS AND DISCUSSION

A. Demographic Analysis

In this study, researchers distributed 100 questionnaires to Lazada application users in the community in Pekanbaru city. Based on the data obtained, it will be collected and identified based on gender, period of application use and intensity of application use in a month. The purpose of this identification process was to learn more about the overall characteristics of the study's respondents. Table 2 displays the demographic analysis that was employed in this investigation.

Table 2. Demographic Analysis

No.	Category	Item	Total	Percentage (%)
1.	Gender	Male	41	41%
		Female	59	59%
2.	Period of Application Use	<6 Months	29	29%
		6-12 Months	17	17%
		1-2 Years	30	30%
		>2 Years	24	24%
3.	Purchasing Goods with the Application in a Month	1-3 Times	69	69%
		4-6 Times	18	18%
		>6 Times	13	13%

B. Measurement Model Analysis / Outer Model

Discriminant validity, average variance extracted (AVE), internal consistency reliability, and individual indicator reliability make up the four testing stages that make up the measurement model analysis (Outer Model).

Table 3. Convergent Validity and Reliability Test

Variables	Item Code	Outer Loadings	CA	CR	AVE
Information Quality	IQ1	0.841	0.819	0.881	0.649
	IQ2	0.816			
	IQ3	0.755			
	IQ4	0.807			
System Quality	SQ1	0.737	0.753	0.844	0.575
	SQ2	0.812			
	SQ3	0.785			
	SQ4	0.695			
Service Quality	SVQ1	0.883	0.867	0.918	0.790
	SVQ2	0.911			
	SVQ3	0.872			
Use	U1	0.934	0.838	0.925	0.860
	U2	0.920			
Trust	T1	0.853	0.767	0.866	0.683
	T2	0.935			
	T3	0.688			
User Satisfaction	US1	0.838	0.881	0.918	0.737
	US2	0.861			
	US3	0.869			
	US4	0.867			
Net Benefit	NB1	0.850	0.762	0.859	0.671
	NB2	0.839			
	NB3	0.765			

In order to conduct this reliability test on individual indicators, we look at the outer loading results, which show how strongly each indicator is correlated with the variables. These indicators are able to measure their variables if and only if their outer loading value is more than 0.7. However, it can still be considered valid and acceptable if the outer loading value is greater than 0.6 [11][12]. To determine the reliability value of a construct, the following step in internal consistency reliability is to utilize Cronbach's alpha (CA) and the composite reliability (CR) value. The criterion value that is used is 0.7.

This AVE value, which has a minimum value of 0.5 and indicates convergent validity, is ideal because it shows the indicator variance in the latent variable (construct). Discriminant validity testing compares a variable's square root of AVE to other variables to determine its uniqueness. The variable's root of the AVE must be higher than the other variable's to determine Fornell-Larcker's cross loading value.

Table 4. Fornell-Lacker's Cross Loading Value

	IQ	NB	SVQ	SQ	T	U	US
IQ	0.805						
NB	0.532	0.819					
SVQ	0.424	0.347	0.889				
SQ	0.568	0.521	0.491	0.758			
T	0.523	0.434	0.634	0.583	0.827		
U	0.416	0.435	0.582	0.526	0.671	0.927	
US	0.570	0.484	0.550	0.535	0.758	0.752	0.859

After conducting four stages of model measurement testing (outer model) in Tables 3 and 4, it is known that the four stages of testing have met the requirements for their respective tests. Therefore, it can be said that the model in this study has good qualities.

C. Structural Model Analysis / Inner Model

The six testing steps in the structural model analysis are as follows, namely *path coefficient* (β), *coefficient of determination* (R^2), *t-test with bootstrapping*, *effect size* (f^2), *predictive relevance* (Q^2), and *relative impact* (q^2).

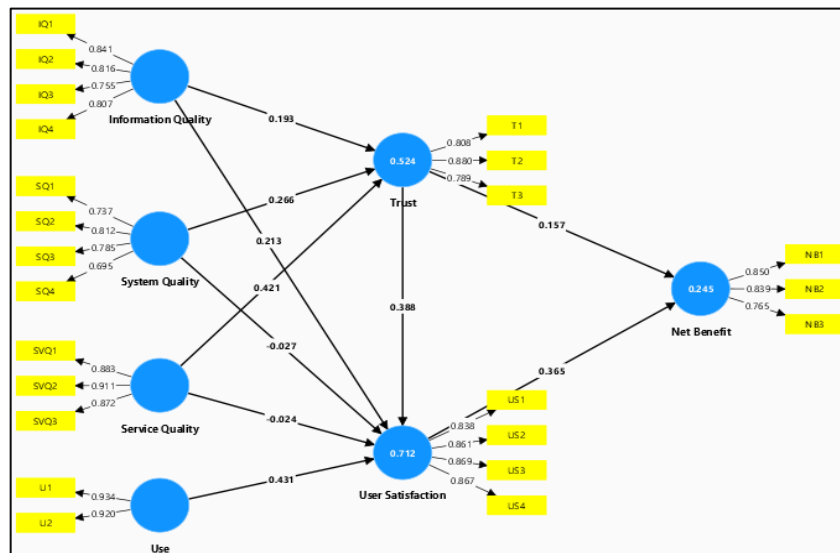


Figure 4. Structural Model Results

The PLS analysis results are displayed in Figure 4. The value on the path is examined in order to test the path coefficient. When the threshold value is more than 0.1, it indicates that the path significantly affects the research model. Based on the figure above, it is found that of the 10 pathways in this research model, there are 2 insignificant pathways, namely System Quality $\rightarrow$ User Satisfaction (-0.027) and Service Quality $\rightarrow$ User Satisfaction (-0.024) because they have a value below 0.1 and the other 8 pathways have significant results because they have a β value greater than 0.1.

The R-Square stage also evaluates the variety of independent variable-dependent variable changes using 0.67 (strong), 0.33 (moderate), and 0.19 (weak) values. Figure 4 shows that the User Satisfaction variable's R value of (0.712) is significant, the Trust variable (0.524) is moderate, and the Net Benefit variable (0.245) is weak. The t-test with bootstrapping follows with a 5% significance level. Accept the study hypothesis if the t-test value exceeds 1.96 [19]. Table 5 shows t-test results. The table shows that 6 hypotheses of the relationship between variables meet the t-test requirements and are accepted, including the relationship between Information Quality and User Satisfaction, the variable Service Quality and Trust, the System Quality variable with Trust, the Trust variable with User Satisfaction, the Use variable with User Satisfaction and the User Satisfaction variable with Net Benefit. As for other hypotheses, they are unacceptable.

D. Hypothesis Test Results

The structural model's findings for each hypothesis are displayed as follows in Table 5.

Table 5. Hypothesis Testing Results

Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values	Supported
H1: IQ→T	0.193	0.204	0.100	1.941	0.052	No
H2: IQ→US	0.213	0.217	0.083	2.565	0.010	Yes
H3: SVQ→T	0.421	0.407	0.105	4.000	0.000	Yes
H4: SVQ→US	-0.024	-0.024	0.089	0.266	0.790	No
H5: SQ→T	0.266	0.274	0.122	2.173	0.030	Yes
H6: SQ→US	-0.027	-0.018	0.109	0.248	0.804	No
H7: T→NB	0.157	0.157	0.149	1.056	0.291	No
H8: T→US	0.388	0.374	0.122	3.188	0.001	Yes
H9: U→US	0.431	0.435	0.084	5.154	0.000	Yes
H10: US→NB	0.365	0.372	0.144	2.531	0.011	Yes

H₁: Information Quality (IQ) has a significant effect on Trust (T)

The inner model analysis of H₁ indicated rejection of the IQ → T hypothesis. The t-test value was less than 1.96 (1.941), suggesting IQ does not affect T. These findings support previous studies [20] that found trust is unaffected by information quality, suggesting that high-quality information will boost Lazada app users' confidence. To keep users trusting Lazada, its developers should prioritize data quality by keeping data current and accurate and improving data quality overall.

H₂: Information Quality (IQ) has a significant effect on User Satisfaction (US).

The H₂ inner model analysis supported the IQ → US hypothesis. With the t-test value below 1.96 (2.565), IQ affects the US. The results of this hypothesis match those of other studies [5][21] Information Quality strongly boosts User Satisfaction (US). The Lazada app developer must monitor data quality to make product and service information easy to view. To improve user satisfaction, the developer can make the app more user-friendly.

H₃ : Service Quality (SVQ) has a significant effect on Trust (T).

After the internal model test on H₃, the SVQ → T hypothesis was approved. With a t-test value over 1.96 (4,000), SVQ affects T. Similar to previous research, the hypothesis results [21] which showed that Service Quality (SVQ) positively and significantly affects Trust. This suggests that customer service's responsiveness, concern, and promise to solve problems can boost users' system confidence. Thus, high-quality service can boost Lazada app users' trust.

H₄: Service Quality (SVQ) has a significant effect on User Satisfaction (US).

The SVQ → US hypothesis was rejected in H₄ inner model analysis. With the t-test value below 1.96 (0.266) shows that SVQ does not affect US. This hypothesis contradicts other studies[21]. As customer service provides full attention in solving problems when using the application is associated with the service quality variable's empathy indicator, the lowest value indicates poor service. Thus, Lazada app services fail to customer satisfaction.

H₅: System Quality (SQ) has a significant influence on Trust (T).

The inner model analysis of H₅ supported the SQ → T hypothesis. The t-test value below 1.96 (2.173), shows that SQ affects T. This analysis confirms previous research [21], which means that a system that responds quickly, is easy to use, is error-free, and secures

transactions will increase user trust. So, good system quality can boost Lazada app user trust.

H₆ : System Quality (SQ) has a significant effect on User Satisfaction (US).

The results of the inner model analysis of H₆, the SQ → US hypothesis was rejected. The results show that SQ does not affect US because the t-test value was less than 1.96 (0.248). It is well known that this analysis contradicts previous studies[9]. The lowest value for the ease of use indicator on the system quality variable suggests that the system is still not user-friendly enough to provide a pleasant experience or make it easy to operate. Thus, Lazada app quality does not affect customer satisfaction.

H₇ : Trust (T) has a significant effect on Net Benefits (NB).

The results of the inner model analysis of H₇ stated that the T → NB hypothesis was not accepted. The results were obtained from the t-test value below 1.96 (1.056), which means that T has no effect on NB. The findings of this research are not in line with previous research [20]. Therefore, Lazada application developers should continue to pay attention and always maintain the trust that has been given by users to the Lazada application. In addition, developers must also try harder to create new features that can make it easier for users when using Lazada so that user satisfaction can continue to increase over time.

H₈: Trust (T) has a significant effect on User Satisfaction (US).

The inner model analysis of H₈ supported the T → US hypothesis. T affects US, according to a t-test above 1.96 (3.188). This hypothesis matches previous research [22] that found Trust (T) positively affects User Satisfaction (US). Users will be happier if they trust the app's transactions, the party keeps its promises, and the app is the best option. Thus, user satisfaction with Lazada is proportional to trust.

H₉: Use (U) has a significant effect on User Satisfaction (US).

The inner model analysis on H₉ supported the hypothesis U → US. A t-test value greater than 1.96 (5.154), indicates that U affects US. This hypothesis matches previous research [23] which found that Use (U) has a positive and substantial effect on User Satisfaction (US). As a result, it is possible to assume that the more people use the Lazada app, the happier they are.

H₁₀ : User Satisfaction (US) has a significant effect on Net Benefits (NB).

The US → NB hypothesis was supported by H₁₀ inner model analysis. A t-test value greater than 1.96 (2.531), indicates that US affects NB. This hypothesis was supported by previous studies [9][11] showing that US positively impacts NB. This is due to users' high satisfaction with the app overall, apps that encourage repeat purchases, and apps that exceed expectations. So it can be concluded that user satisfaction can increase the net benefits of the Lazada application for users.

V. CONCLUSIONS

The researcher identified the aspects that determine the level of user satisfaction with the Lazada e-commerce application, such as information quality, trust, and usage. Service and system quality are not affected. The findings of this study identify characteristics that influence trust in the Lazada e-commerce application, such as service quality and system quality. Meanwhile, trust is unaffected by information quality. The study found that there is a relationship between user satisfaction and net benefits for the Lazada e-commerce application. Meanwhile, net benefits are unaffected by the trust variable. The study's findings also indicate that customer trust and contentment might have an impact on the

overall benefits for Lazada e-commerce application developers. The findings of this study can be useful for businesses creating Lazada e-commerce applications. The study advises application developers to focus their efforts on the elements that drive user happiness, including information quality, trust, and usage.

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