

APPLICATION OF THE TECHNOLOGY ACCEPTANCE MODEL IN MEASURING CUSTOMER SATISFACTION AND LOYALTY

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ABSTRACT

This study aims to investigate the influence of technology acceptance factors and website service quality in measuring customer satisfaction and loyalty for online shopping. This research was conducted in Mamuju, Indonesia. The sample was selected using accidental sampling involving 200 Shopee marketplace users. The data in this study were processed using structural Equation Modeling (SEM) with partial least square alternative 3.0 (PLS). The results of this study indicate that the technology acceptance factor has a positive and significant effect on customer satisfaction, the technology acceptance factor has a positive and significant effect on customer loyalty, website service quality has a positive and significant effect on customer satisfaction, website service quality has a positive and significant effect on customer loyalty and Consumer satisfaction has a positive and significant influence on consumer loyalty as well as customer satisfaction also plays a moderating role in the technology acceptance factor on loyalty through customer satisfaction and website service quality on customer loyalty through customer satisfaction.

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1. INTRODUCTION

Technology is currently experiencing rapid development. Along with global technological progress, it has affected many aspects of life such as the economy, politics, arts, and culture, even in the field of education. Technological progress is something that cannot be avoided in this life because it will develop according to the development of science. Every innovation is created to provide positive benefits for humans and create various conveniences and solutions for human activities. Technology growth in Industry 4.0 is very fast. One of them is the growth of information technology assisted by the development of electronics and communication technology. Evidence of the rapid development of information technology is the use of the internet. Nowadays almost everyone can easily access the internet.

The Internet is a technology product that has become a staple lifestyle for people around the world in the last few decades, including in Indonesia. Unbeknownst to us, the Internet has changed our lifestyle, societal habits, economy, and culture. The Internet gives us access to many aspects of our life needs for example, communication, business, information, entertainment, education, etc. The number of internet users continues to grow significantly due to the variety of applications and features offered. Internet user penetration in Indonesia is around 77.02% of the total population. This figure is the result of a survey conducted by APJII (Association of Indonesian Internet Service Providers) in 2021-2022.

Indonesia itself is increasing its e-commerce market share. This is evidenced by the increasing number of internet users and has great potential for e-commerce marketers. One of the prosperous e-

commerce companies that have seized opportunities in the Indonesian e-commerce market is Shopee. One of the popular marketplace applications used today.

Apart from buying and selling activities during this period, buyers do not need to come directly to the store. This is often referred to as the e-commerce phenomenon. According to the 2019 Central Bureau of Statistics survey results, 15.08 out of 101 regencies/cities in every province in Indonesia are e-commerce businesses. This shows that e-commerce in Indonesia is still relatively small. However, Statistika notes that the number of e-commerce users in Indonesia has grown very rapidly in the last few years. The Price 2022 findings report reveals the top five e-commerce websites with the most visitors, namely Tokopedia, Shopee, Bukalapak, Lazada, and Blibli. However, based on the Appstore and Playstore rankings, Shopee beat Tokopedia to take the lead. Shopee is an e-commerce platform that was first launched in Singapore in 2015.

The good response from the community regarding the acceptance of this technology has led to a theoretical model of information system acceptance, namely the Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) has two indicators that are used to measure TAM in this study, namely perceived ease of use, which means that work will be completed quickly with the presence of technology, and perceived usefulness, which means increased work as well. obtained from the existence of technology that everyone trusts.

Website service quality is also an important factor to determine the success or failure of e-commerce for two reasons. First, it affects consumer satisfaction and loyalty in online shopping. Service quality is the customer's evaluation and assessment of the superiority and quality of e-service delivery in the virtual market. The quality of e-commerce services is assessed based on consumer perceptions regarding the quality of services provided based on the experience of using the platform, the ability of the e-commerce platform to deal with technical difficulties and obstacles when using the service, and the level of consumer satisfaction after using the e-commerce platform.

Online shopping certainly has pros and cons for consumers. The perceived benefits are in the form of convenience and comfort, there is no need to go far to the place of purchase which can incur additional costs, simply open the required application or website, and the desired brand. You can easily choose various types of products in a short time. In addition, compared to shopping at malls, online marketplaces often offer more competitive prices and offer consumers more promotions. Online shopping is considered more convenient and efficient than offline shopping. But online shopping also has pitfalls. One of them is the possibility of receiving a product that does not meet consumer expectations in terms of size, color, convenience, etc. This is due to restrictions for consumers to test products before purchasing online. These incidents can occur across a wide range of product categories, including clothing, home appliances, cosmetics, and so on.

This has become a common phenomenon in online buying and selling activities. Where there are always advantages and disadvantages or advantages and disadvantages in the online shopping process. The ability or inability to use technology can impact gains and losses, which of course is closely related to customer satisfaction and also affect consumer loyalty.

Research on the technology acceptance model is interesting to study because the results of some studies show various findings. States that the factor of technology acceptance on perceived usefulness does not affect consumer loyalty, while perceptions of the convenience and quality of website services show a positive and significant influence on consumer loyalty [1]. Research results [2] state that the technology acceptance factor has no significant relationship with consumer loyalty. Other findings are also interesting to study, namely from [3] which state that perceived usefulness and perceived ease of use have a positive and significant impact on customer satisfaction and customer loyalty. The results of this research are also supported by research results from [4] which state that perceived usefulness and perceived ease of use are positively related to customer satisfaction.

Other research results [5] state that there is no significant effect of technology acceptance factors on customer loyalty partially but has a positive influence. This study is different from the results from [6] which state that the technology acceptance factor has a significant effect on customer loyalty, and technology acceptance factor also has a significant effect on customer satisfaction. The results of this research are supported by [7] who stated that perceived usefulness and perceived ease of use were significant predictors of user satisfaction with the web. Further research results from [8] state that the technology acceptance factor has a direct or indirect impact on customer satisfaction and loyalty. It is supported by [9] who states that the technology acceptance factor has a positive effect on customer e-satisfaction and e-loyalty directly.

Other research is also interesting to study, namely from [10] that service quality has a significant effect on customer satisfaction. This finding is in line with [11] which states that website service quality has a positive effect on customer satisfaction and also has a direct effect on consumer loyalty. This contradicts the results of research [12] that website service quality does not affect customer satisfaction. This finding is consistent with [13] that consumer loyalty is not directly affected by web quality, but satisfaction plays a role in mediating the effect of web quality on consumer loyalty significantly. Further research results from [14] that service quality and satisfaction each affect loyalty. This is following research from [15] that service

quality has a significant effect on customer loyalty and satisfaction also has a significant effect on customer loyalty.

Based on the background described above, the researchers conducted research related to the "Application of the Technology Acceptance Model in Measuring Consumer Satisfaction and Loyalty".

Technology Acceptance Model (TAM), first introduced by Fred Davis in 1986, is one of the models developed to analyze and understand the factors that influence the acceptance of the use of computer technology. TAM is intended to describe and assess user acceptance of the information system. A TAM provides a theoretical basis for determining the factors that affect the acceptance of technology in an organization. TAM describes the causal relationship between beliefs (about the usefulness of information systems and their usefulness) and user actions, goals, and actual use of information systems [16].

In general, research on information technology acceptance is based on the Technology Acceptance Model (TAM) introduced by Davis (1989), an individual acceptance of technology based on two beliefs, namely perceived ease of use and perceived ease of use [5].

The perception of ease of use is that technology allows work to be completed quickly. These perceptual measures include ease of control, ease of learning, increased competence, flexibility, clarity, and understanding. Furthermore, the perception of expediency is the increase in jobs obtained from the existence of technology which is the religion of every individual. Some indicators of this perception are useful, making work faster, increasing effectiveness, increasing productivity, and sharing work performance [17].

According to [18] said that the quality of internet services in interaction with websites is the ability of websites to effectively and efficiently facilitate the process of buying, and delivering goods or services to consumers. Place quality is evaluated not only during service-providing interactions but also after service is received.

Overall service quality is the customer's evaluation and assessment of the superiority and quality of e-service delivery in the virtual market. The quality of e-commerce services is assessed based on consumer perceptions regarding the quality of services provided based on the experience of using the platform, the ability of the e-commerce platform to deal with technical difficulties and obstacles when using the service, and the level of customer satisfaction after using the e-commerce platform [19]. E-commerce websites are required to provide a complete range of products, fulfill orders correctly, deliver goods as quickly as possible, be responsive to consumer complaints, provide effective and efficient payments, and make it easy to track goods shipments [20].

Defines service quality as the difference between what the customer expects from the service and what is delivered [21]. They developed the SERVQUAL model into four scales containing reliability, responsiveness, assurance, and empathy to measure online SERVQUAL user cognition.

According to [20] Consumer satisfaction is a person's feeling of happiness or disappointment due to the difference between their perception of the ability or performance of a product and their expectations. Consumer satisfaction is expressed in the form of consumer perceived value. Consumer satisfaction can be determined based on consumer reactions to the experience of enjoying purchases and the experience of buying products or services. In this case, the assessment of satisfaction itself may relate to some of the product or service attributes enjoyed, but may also relate to the overall value of the product or service [22].

According to [23] several factors play an important role in the assessment of electronic satisfaction, namely; (a) convenience, consumers do not need to leave the house or travel to find and obtain goods online, (b) site design, good website design is attractive with easy search, (c) financial security, evaluating the site in terms of transaction security services.

According to [24] Consumer loyalty is a commitment to make decisions about whether to buy a desired product or service in the future, even though situational influences and various available marketing initiatives can change customer behavior. Based on the theory above, it can be concluded that consumer loyalty is the attitude of consumers to buy a company's products or services repeatedly and consistently.

According to [5] Customer loyalty has several characteristics namely; (a) making regular repeat purchases, which are situations where a customer uses a product or service several times and makes purchases from the same business, (b) purchases across product and service lines, are situations where customers buy products or services that different in the same location, (c) recommend to others, is a situation where customers in the community recommend and respond positively, (d) shows immunity to the pull of competitors, is a situation where customers show something that is seen as the strength of the product with similar products and has the same function so that they are not easily influenced by the attractiveness of competitors from other similar products.

2. RESEARCH METHOD

This research uses quantitative methods with descriptive and explanatory approaches. The descriptive approach in this study seeks to explain the results of research on data that has been processed.

While the explanatory approach seeks to explain the relationship between the influences of the variables used in this study.

The population in this study is all the people of Mamuju Regency who use the Shopee application. Because the population size is unknown, the determination of the sample is based on the guidelines put forward by Hair that using SEM analysis requires a sample of 100-200 samples for the maximum likelihood estimation technique. Thus, the number of samples used in this study was 200. Therefore, the sampling method used was non-probability sampling with accidental sampling techniques, namely sampling techniques based on chance, so that researchers can sample anyone they meet without planning previously. The data collection method used in this study was a questionnaire. The data analysis method in this study uses a structural equation model (SEM) with a Partial Least Squares of 3.0 (PLS).

Based on the previous description, the relationship between conceptualized variables can be described in the form of a model that describes the relationship between the influence of technology acceptance factors, website service quality, customer satisfaction, and loyalty. The model constructed in this study is the result of research construction resulting from a review of previous research literature. The following is a model in this study:

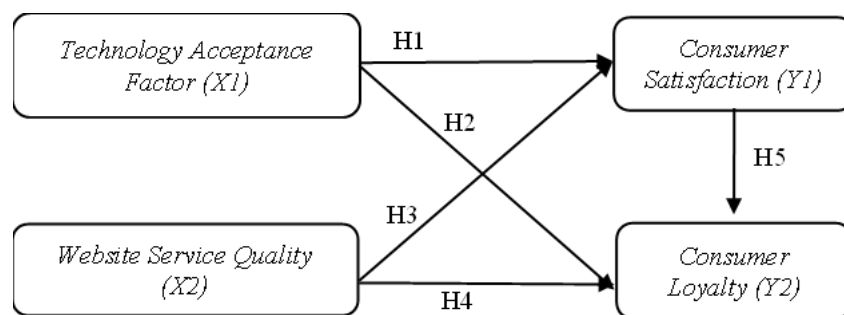


Figure 1. Research Framework

Based on the framework above, the hypothesis used in this study is as follows:

- H1: The Technology Acceptance Factor has a positive effect on Consumer Satisfaction with Online Shopping
 H2: The Effect of Technology Acceptance Factor has a positive effect on Consumer Loyalty for Online Shopping
 H3: Website service quality has a positive effect on online shopping consumer satisfaction
 H4: Website service quality has a positive effect on online shopping consumer loyalty
 H5: Consumer Satisfaction has a positive effect on Consumer Loyalty for Online Shopping

3. RESULTS AND ANALYSIS

This research was conducted using a reflective measurement model (outer model) and an evaluation of the structural model (inner model). The result is as follows:

3.1. Reflective Measurement Model (Outer Model)

Outer models the relationship between the indicator and the construct. The initial evaluation or model measurement test is reflective, namely with convergent validity and construct validity.

3.1.1. Convergent Validity

Evaluation of Convergent Validity begins by looking at the item reliability (validity indicator) indicated by the loading factor value. Following the standard rules (rule of growth), the loading factor indicator value is > 0.7 to be said to be valid. If all indicators have been declared > 0.7 then these indicators have been declared fit.

Table 1. Outer Loading

	Technology Acceptance Factor (X1)	Consumer Satisfaction (Y1)	Website Service Quality (X2)	Consumer Loyalty (Y2)	Information
Perceived usefulness of use	0.8591				Valid
	0.8266				Valid
Perceived ease of use (perceived ease of use)	0.8092				Valid
	0.7421				Valid
Comfort		0.8917			Valid
Site design		0.8694			Valid

<i>financial security</i>	0.8819		Valid
Reliability		0.7279	Valid
responsiveness		0.8543	Valid
Guarantee		0.9019	Valid
Empathy		0.9164	Valid
Make regular repeat purchases		0.7865	Valid
Purchasing across product and service lines		0.8272	Valid
Recommend to others		0.7476	Valid
Demonstrates immunity to the pull of competitors		0.8497	Valid

Source: Primary data processing, 2023

From the results of data processing shown in Figure 4.4 above, it can be seen that in this study the loading value of all system quality variable indicators is greater than 0.7. This shows that variable indicators with loading values greater than 0.7 have high validity so that they meet convergent validity.

3.1.2. Discriminant Validity

The discriminant validity method can be seen in the cross-loading value compared to the criterion value > 0.7 for each variable in the measurement must be greater than the other variables.

Table 2. Cross Loading

	Technology Acceptance Factor	Consumer Satisfaction	Website Service Quality	Consumer Loyalty
Perceived usefulness of use	0.859	0.615	0.605	0.535
	0.827	0.576	0.601	0.539
Perceived ease of use (perceived ease of use)	0.809	0.632	0.568	0.547
	0.742	0.494	0.46	0.502
Comfort	0.578	0.892	0.746	0.615
<i>Site design</i>	0.679	0.869	0.6	0.643
<i>financial security</i>	0.641	0.882	0.714	0.697
Reliability	0.591	0.519	0.728	0.541
responsiveness	0.609	0.677	0.854	0.593
Guarantee	0.593	0.737	0.902	0.655
Empathy	0.583	0.711	0.916	0.661
Make regular repeat purchases	0.548	0.668	0.564	0.786
Purchasing across product and service lines	0.600	0.635	0.601	0.827
Recommend to others	0.401	0.432	0.528	0.748
Demonstrates immunity to the pull of competitors	0.533	0.613	0.616	0.850

Source: Primary data processing, 2023

Based on the results of discriminant validity in Table 4.8 above, it can be seen in the cross-loading value that the variable technology acceptance factors (X1) website service quality (X2) customer satisfaction (X1), and consumer loyalty (Y2) have a greater value > 0.7 and it can be stated that this research variable is valid.

3.1.3. Construct Reliability

A reliable instrument is an instrument that, when used several times to measure the same object, will produce the same data. Criteria for determining construct reliability, namely:

- 1) Composite reliability, data that has composite reliability > 0.6 has high reliability.
- 2) Cronbach Alpha, reliability test strengthened with Cronbach alpha. Expected value > 0.7 for all constructs.
- 3) The result of $\rho_A > 0.7$. Average Variance Extracted (AVE). Expected AVE value > 0.5

Table 3. Construct Reliability

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Technology Acceptance Factor (X1)	0.825	0.829	0.884	0.657
Consumer Satisfaction (Y1)	0.856	0.857	0.912	0.776
Website Service Quality (X2)	0.873	0.887	0.914	0.728
Consumer Loyalty (Y2)	0.817	0.826	0.879	0.646

Source: Primary data processing, 2023

Based on the Construct Reliability table, it is known that:

1) The result of Cronbach Alpha > 0.7

The Cronbach Alpha value of each variable is more than 0.7. Starting from the technology acceptance factor variable, there is a Cronbach's alpha value of 0.825, a consumer satisfaction variable of 0.856, a website service quality variable of 0.873, and a consumer loyalty variable of 0.817. This means that all variables are said to be reliable based on the results of Cronbach's alpha.

2) Results from rho_A > 0.7

Value of rho_A of each variable is more than 0.7. Starting from the technology acceptance factor variable, there is a rho value_A 0.829, a consumer satisfaction variable of 0.857, a website service quality variable of 0.887, and a customer loyalty variable of 0.826. This means that all variables are said to be reliable based on the results of rho_A.

3) The result of Composite Reliability > 0.6

The result of composite reliability is more than 0.6. Starting from the technology acceptance factor variable, there is a composite reliability value of 0.884, a consumer satisfaction variable of 0.912, a website service quality variable of 0.914, and a consumer loyalty variable of 0.879. Based on the results of composite reliability, all variables are said to be reliable.

4) The result of average Variance Extracted (AVE) > 0.5

The result of AVE is more than 0.5. Starting from the technology acceptance factor variable, there is a composite reliability value of 0.657, a consumer satisfaction variable of 0.776, a website service quality variable of 0.728, and a consumer loyalty variable of 0.646. Based on the results of AVE, it indicates that the average value of these variables has a good convergent value and meets the standard requirements.

3.2. Evaluation of the Structural Model (Inner Model)

This inner model was obtained after analyzing the validity and reliability, the structural equation model was used to assess the strength of the model proposed in this study, namely to test the R2 criterion, effect size, path coefficient estimation, and the stability of the estimation which was tested using the t statistic through resampling the bootstrapping method.

3.2.1. Coefficient of determination (R2)

Used to measure how much the independent variable contributes to the dependent variable. The analysis criteria are:

- 1) If the value of R2 = 0.75 means substantial (big/strong)
- 2) If the value of R2 = 0.50 means moderate (moderate)
- 3) If the value of R2 = 0.25 means weak (small).

Table 4. R Square

Variable	R Square	Information
Consumer Satisfaction (Y1)	0.670	Currently
Consumer Loyalty (Y2)	0.613	Currently

Source: Primary data processing, 2023

Based on the table above it can be seen that:

- 1) The R Square value on consumer satisfaction is 0.670 which means that the variable consumer satisfaction can be explained by the variable factors of technology acceptance and website service quality by 67%, while the remaining 33% is explained by other variables not present in this study.
- 2) The R Square value for consumer loyalty is 0.613 which means that the consumer loyalty variable can be explained by the technology acceptance factors and website service quality variables by 61.3%, while the remaining 38.7% is explained by other variables not present in this study.

3.2.2. Effect size f2 (f-square)

Is a measure used to assess the relative impact of the independent variable on the dependent variable? There are criteria for analyzing it, namely:

- 1) If the value of f² = 0.02 means small (bad)
- 2) If the value of f² = 0.15 means moderate (moderate)
- 3) If the value of f² = 0.35 means big (good).

Table 5. f Square

	Technology Acceptance Factor (X1)	Consumer Satisfaction (Y1)	Website Service Quality (X2)	Consumer Loyalty (Y2)
Technology Acceptance Factor (X1)		0.18		0.03
Consumer Satisfaction (Y1)				0.12
Website Service Quality (X2)		0.47		0.08
Consumer Loyalty (Y2)				

Source: Primary data processing, 2023

Based on the f square table it can be seen that:

- 1) The relative impact of the technology acceptance factor variable on consumer satisfaction is 0.18, which means it has a moderate impact.
- 2) The relative impact of the website service quality variable on consumer satisfaction is 0.47, meaning it has a large impact.
- 3) The relative impact of the technology acceptance factor variable on consumer loyalty is 0.03, which means it has a small impact.
- 4) The relative impact of the website service quality variable on consumer loyalty is 0.08, which means it has a small impact.
- 5) The relative impact of the consumer satisfaction variable on consumer loyalty is 0.12, which means it has a small impact.

3.3. Hypothesis Testing

Basuki and Saputra, (2018) stated that this test includes a significant value for each path coefficient which states that there is a significant or insignificant effect between constructs. Structural model testing is used to test hypotheses between research variables. It can be seen from the p-value and t-statistic, if the t-statistic value is > 1.96 then the effect is valid, or if the p-value is < 0.05 then the effect is significant.

Table 6. Path Coefficient

	Original Sample (O)	T Statistics ($ O/STDEV $)	P Values	Information
Technology Acceptance Factor (X1) -> Consumer Satisfaction (Y1)	0.340	4,332	0.000	Accepted
Technology Acceptance Factor (X1) -> Consumer Loyalty (Y2)	0.173	2,490	0.013	Accepted
Consumer Satisfaction (Y1) -> Consumer Loyalty (Y2)	0.379	3,736	0.000	Accepted
Website Service Quality (X2) -> Consumer Satisfaction (Y1)	0.545	7,689	0.000	Accepted
Website Service Quality (X2) -> Consumer Loyalty (Y2)	0.304	3.156	0.002	Accepted

Source: Primary data processing, 2023

Based on the results of the structural model test in the table, it is known that:

3.3.1. Effect of Technology Acceptance Factor on Satisfaction (H1)

The results show that the hypothesis is accepted. Seba in the table above shows that the technology acceptance factor has a significant effect on consumer satisfaction with a t-statistic of $4.332 > 1.96$, and a p-value of $0.000 < 0.05$ so it can be said to have a significant effect. Then hypothesis H1 Technology acceptance factor has a positive and significant effect on consumer satisfaction is accepted.

3.3.2. Effect of Technology Acceptance Factor on Loyalty (H2)

The results show that the hypothesis is accepted. Seba in the table above shows that the technology acceptance factor has a significant effect on consumer loyalty with a t-statistic of $2.490 > 1.96$, and a p-value of $0.013 < 0.05$ so it can be said to have a significant effect. Then hypothesis H2 Technology acceptance factor has a positive and significant effect on Consumer Loyalty is accepted.

3.3.3. Effect of Website Service Quality on Satisfaction (H3)

The results show that the hypothesis is accepted. Seba in the table above shows that website service quality has a significant effect on customer satisfaction with a t-statistic of $7.689 > 1.96$, and a p-value of $0.000 < 0.05$ so it can be said to have a significant effect. Then the hypothesis H3 Website Service Quality has a positive and significant effect on Customer Satisfaction is accepted.

3.3.4. The Effect of Website Service Quality on Loyalty (H4)

The results show that the hypothesis is accepted. In the table above shows that website service quality has a significant effect on consumer loyalty with a t-statistic of $3.156 > 1.96$, and a p-value of $0.002 < 0.05$ so it can be said to have a significant effect. Then the H4 hypothesis of Website Service Quality has a positive and significant effect on Consumer Loyalty is accepted.

3.3.5. Effect of Consumer Satisfaction on Consumer Loyalty (H5)

The results show that the hypothesis is accepted. In the table above shows that consumer satisfaction has a significant effect on consumer loyalty with a t-statistic of $3.736 > 1.96$, and a p-value of $0.000 < 0.05$ so it can be said to have a significant effect. Then hypothesis H5 Consumer Satisfaction has a positive and significant effect on Consumer Loyalty is accepted.

Table 7 Specific Indirect Effects

	Original Sample (O)	Sample Means (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Information
Technology Acceptance Factor_ - > Consumer Satisfaction -> Consumer Loyalty	0.129	0.125	0.044	2,918	0.004	Positive significant
Website Service Quality -> Customer Satisfaction -> Consumer Loyalty	0.207	0.204	0.06	3,437	0.001	Positive significant

Source: Primary data processing, 2023

Consumer satisfaction plays a moderating role. The technology acceptance factor can affect consumer loyalty through consumer satisfaction, with a larger T-statistic value of $2.918 > 1.96$ and a smaller P value of $0.004 < 0.05$. Website service quality also influences consumer loyalty through customer satisfaction, with a larger T-statistic value of $3.437 > 1.96$ and a smaller P value of $0.001 < 0.05$.

4. CONCLUSION

Based on the results of the research and discussion regarding the application of the technology acceptance model in measuring customer satisfaction and loyalty for online shopping, the authors can draw several conclusions that the technology acceptance factor has proven to have a positive and significant effect on online shopping consumer satisfaction, the technology acceptance factor has proven to have a positive and significant effect on online shopping consumer loyalty, the website service quality factor has proven to have a positive and significant effect on online shopping customer satisfaction, The website service quality factor has proven to have a positive and significant effect on online shopping customer loyalty and customer satisfaction has been shown to have a positive and significant effect on online shopping customer loyalty while consumer satisfaction also plays a moderating role in the technology acceptance factor on loyalty through customer satisfaction and website service quality on customer loyalty through consumer satisfaction.

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