In order to shape e-loyalty, previous researchers revealed in their researches that e-loyalty influenced by e-satisfaction (Anderson and Srinivasan, 2003), trust (Flavián et al, 2006), and brand image (Ogba and Tan, 2009). Remind that it is very difficult to get e-loyalty in e-commerce, electronic satisfaction from e-commerce services is very important for customers in deciding whether to continue the relationship with e-commerce (Ribbink, et al 2004). Satisfaction is an important prerequisite of e-loyalty (Valvi and West, 2013) . Furthermore, trust is a crucial component to build e-loyalty (Lee and Sohn, 2004). Build a trusted website is the main problem for brands because of consumers likely to purchase from and stay loyal to only websites they can trust (Bilgihan, 2016) . Finally, a good brand image is that which impacts positively on e-loyalty (Ogba and Tan, 2009). Online brand image plays a more important role in making the consumers loyal to e-commerce once perceived risk is reduced by trust built through prior online experience (Kwon and Lennon, 2009).

2.2. BRAND IMAGE

Brand image refers to the set of associations related to the brand that consumers hold in memory (Keller, 2013). Aghekyan-Simonian, et al (2012) stated that robust brand image products emerge as the most valuable asset for online retailers. Thus, online retailers will benefit from including favorable and robust brand names in their offering and employ marketing strategies that associate these strong brands with their online store, thus consumers can make this connection in their minds. The brand image represents the reasoned or emotional perceptions

consumers attach to specific brands (Low, et al 2000). Dobni and Zinkhan in Cretu (2007) stated that brand image is the mental picture or perception of a brand or a branded product or service and includes symbolic meanings that consumers associate with the specific attributes of a product or service.

A good brand image increases consumers' trust because it can reduce the risk of buying (Chiang and Jang, 2007). Brand characteristics that build brand image are relatively more important in their effects on consumer trust in brands (Lau and Lee, 1999). Brand image can also positively influence customer satisfaction and customer loyalty (Ogba and Tan, 2009) . A good brand image must have a positive impact on customer loyalty and must also influence a greater level of the extent to which customers perceive market offerings and express satisfaction with those offers for long-term pleasure and sustainable profits (Ogba and Tan, 2009). When a brand image is favorable, the message that the company propagates has higher compatibility with consumer cognition thus the company's goals are easier to achieve. In contrast, when a brand image is unfavorable, the company's message is very different from consumer cognition and consequently, the company's goals are more difficult to achieve. (Hsieh, 2007). Therefore, a good, robust brand image could lead to customers' loyalty.

Yun and Good (2007) found in their research that a favorable e-commerce image positively influences e-patronage intentions, which leads to e-loyalty. Brand image plays an important role in assisting customers to decide whether to buy or not the brand and then influencing their repurchase behavior (Bian and Moutinho, 2011). Wu (2011) discovered that brand image has a positive effect on e-loyalty in terms of

hospital brand. Aghekyan-Simonian, et al (2012) found that brand image does influence consumers' online purchase intentions in terms of fashion apparel products. The online purchase itself known as the consequences of e-Loyalty. Ogba and Tan (2009) show that brand image has a positive impact on customer expression of satisfaction and loyalty. Lien et al (2015), found that brand image has a positive effect to trust. Thus, this present study proposes the following hypothesis:

H1: Brand image positively and significantly affects e-Loyalty.

H2: Brand image positively and significantly affects e-Satisfaction.

H3: Brand image positively and significantly affects Trust.

2.3. E-SATISFACTION

Satisfaction is the consumer's fulfillment response. It is a degree to which the level of fulfillment is delightful or not. (Oliver, 2010). Customer satisfaction in e-commerce contexts is more complex than conventional thought (Tang and Huang, 2015). Anderson and Srinivasan (2003) expand satisfaction into e-Satisfaction, which defined as the contentment of the customer with respect to their previous purchasing experience given by electronic commerce. Satisfied customers tend to repurchase from a firm that has satisfied them from their prior shopping through the Internet (Shankar, et al 2003). Moreover, a dissatisfied customer tends to search for alternative information and change to a competitor than a satisfied customer. A dissatisfied customer tends to refuse the efforts of the current e-commerce to build a closer relationship and tends to take steps to relieve dependence from that e-

commerce. In another word, dissatisfied customers no longer stay loyal to e-commerce that delivers an unpleasant past experience.

Satisfaction leads to online customers' repurchase intentions (Tsai et al, 2006). Chang et al (2009) stated that satisfied customers tend to purchase frequently and have positive word of mouth. Lee et al (2009) also stated that satisfied customers tend to generate repurchase intentions. Meanwhile, purchase frequently and positive word of mouth are consequences of e-loyalty. Thus, satisfied customers tend to become loyal customers. It is very important for e-commerce to increase customer satisfaction in order to maintain customer loyalty to e-commerce (Hsu et al, 2013) .

There are several prior pieces of research that investigated the effect of e-Satisfaction on e-Loyalty. Satisfaction builds loyalty, an occurrence that is stronger online rather than offline (Shankar, et al 2003). Lin and Sun, (2009); Tang and Huang (2015) found e-Satisfaction affected e-loyalty in Taiwan's online shopping sites. Audrain-Pontevia, et al (2013) found a similar result of e-Satisfaction effect to e-loyalty in Europe. Ziaullah, et al (2014) found e-Satisfaction affected e-Loyalty in China. Moriuchi and Takahashi (2016) also found that in Japanese online supermarket. Meanwhile (Pereira, et al (2016) also found in their research in the tourism site. Customer satisfaction creates loyalty held without conviction (Wolter, et al 2017). Based on the research above, this present study proposes the following hypothesis:

H4: **e-Satisfaction positively and significantly affects e-Loyalty.**

2.4. TRUST

Morgan and Hunt in Lou and Yuan (2019) stated that trust defined as confidence in the exchange partner's reliability and integrity. Moreover, trust is a willingness to engage in activities where a person is exposed to risk without the ability to control the behavior of others involved (Gefen, 2000). According to Reicheld and Schefter (2000), trust is a matter in e-commerce due to the increase of distance, risk and uncertainties because the customer fully rely on images and promises. In an e-commerce context, trust can be defined as a customer's confidence and belief that their expectations of online business would be met, which is used to explain the e-loyalty development process through expectation confirmation theory (Valvi and West, 2013). Trust includes online consumers' beliefs and expectations about the trust-related characteristics of an online seller (Mcknight and Chervany, 2014). Online consumers desire the e-commerce to be willing and able to act on the consumers' interests, to be truthful in transactions (e.g., not leaking personal information), and to be capable of delivering ordered goods as promised (Tang and Huang, 2015). Hence, retain customer trust will build loyalty towards e-commerce.

E-commerce can reduce the risk perceived by customers by building relationships based on trust (Yousafzai et al, 2003) . Trust can be effectively inspired by providing a safe, convincing, and reliable website. Companies can therefore increase e-loyalty indirectly by increasing the security dimension of their website (Ribbink et al, 2004) . Because there is still a lack of face-to-face contact, trust seems worth considering every time an online purchase is made (Moriuchi and Takahashi, 2016) . Moreover, Anderson and Srinivasan (2003) stated that if

customers do not trust e-commerce, they will not be loyal to them, even though they are generally satisfied. The atmosphere of trust provided by e-commerce can increase e-loyalty and achieve sustainable transaction intentions (Huang, 2008) or in other words increase customers' repurchase intention (Safa and Von Solms, 2016) .

Reichheld and Schefter (2000) stated that in order to gain loyalty, the company must gain the customers' trust first. Trust is perceived as a significant antecedent of customers' willingness to engage in e-commerce (Gefen, 2002). This statement supported by several pieces of research. Ribbink, et al (2004) figured out that trust directly affects e-loyalty. Hsu, et al (2013) found trust has a positive direct effect on e-loyalty in Taiwan B2B e-commerce. Bilgihan (2016) found that trust positively influenced e-Loyalty on the tourism website by investigating Gen Y customers. (Azam, 2015) also found the correlation in Saudi Arabia e-retailing. (Carter, et al (2014) found that trust positively influences e-loyalty in the travel services marketplace. Hence, this present study proposes the following hypothesis:

H5: Trust positively and significantly affects e-Loyalty.

The brand image allegedly affects e-Loyalty and it also allegedly affects respectively e-Satisfaction and trust, thus it can be possible that brand image affects e-Loyalty through e-Satisfaction and trust.

H6: Brand image significantly affects e-Loyalty through e-Satisfaction as a mediating variable.

H7: Brand image significantly affects e-Loyalty through Trust as a mediating variable.

2.5. RESEARH FRAMEWORK

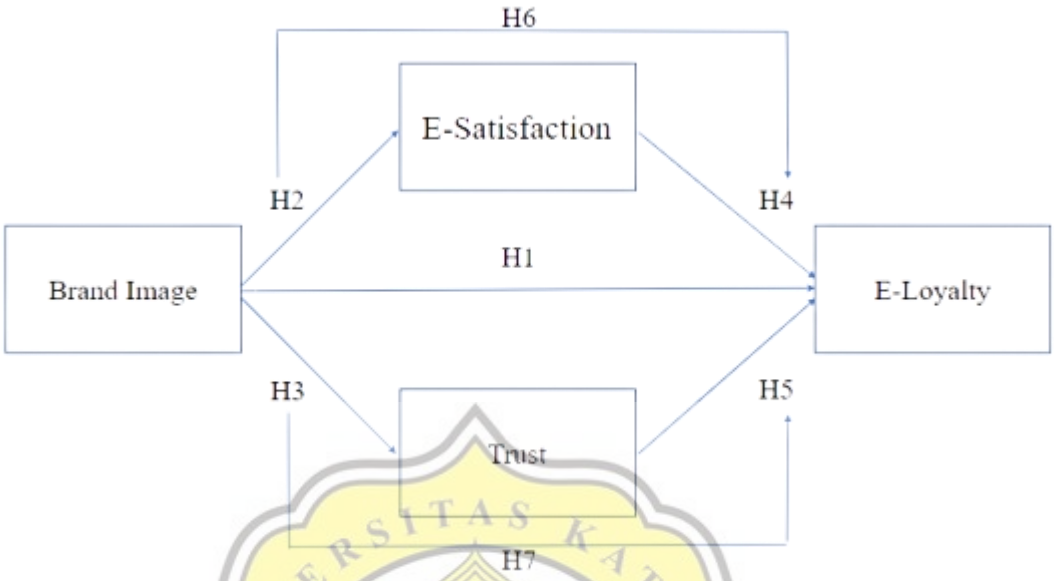

Figure 2.1. Research Framework

The postulated hypotheses above can be seen through a framework as seen in figure 4.1. As the previous research has verified the influence of brand image toward e-loyalty, in this research aim to test whether it will generate equal results as the previous research one. Furthermore, it was also found the positive influence of brand image to e-satisfaction and trust. Therefore, the brand image of Tokopedia allegedly influences not only e-loyalty but also e-satisfaction and trust. Moreover, the brand image of Tokopedia is considered to affect e-Loyalty through e-Satisfaction and Trust as a mediator. Therefore, the brand image of Tokopedia allegedly influences e-Loyalty through e-Satisfaction and Trust as mediators. Meanwhile, a lot of previous researches found the positive influence of e-satisfaction and trust toward e-loyalty. Therefore, this research also aims to test e-satisfaction and trust of Tokopedia users allegedly influence e-loyalty as well.

2.6. OPERATIONAL DEFINITION

An operational definition is a definition expressed in terms of specific criteria for testing or measurement (Cooper and Schindler, 2014) . Furthermore, these terms should refer to empirical standards, which means it must be able to compute, measure, or otherwise gather information through our senses, the definitions must define the characteristics and how they are observed. The followings paragraphs are the operational definition that must be cleared in this research.

E-loyalty means an enduring commitment of the customer to consistently use, preference, repurchasing, and recommendation from one e-commerce. The indicators applied here refer to Toufaily et al (2013) which stated the consequences of e-loyalty which consist of:

1. Frequency in using Tokopedia for searching goods compare other e-commerce
2. Repurchase intention within the last two months
3. Eagerness to switch to another e-commerce
4. Positive e-WOM toward at least one acquaintance

Brand image is feeling by customers toward perception, reputation, and distinct character which stick to the brand, which in Tokopedia known for their user friendly app. The indicators applied here based on Keller (2013) which consist of:

1. Perceived popularity of Tokopedia
2. Perceived good reputation of Tokopedia
3. Perceived of ease of use of the application

E-satisfaction is customer evaluation over the conformity of expectation and reality towards product or service from e-commerce. The indicators applied here refer to Audrain-Pontevia et al (2013) consist of:

1. Perceived enjoyment within a transaction in Tokopedia
2. Perceived conformity of expectation
3. Perceived suitability of the service

Finally, trust is the feeling of customers toward accountability, reliability, and integrity of service provided by the provider. The indicators applied here refer to Gefen (2002) which consist of:

1. Perceived accountability of the transactions' security
2. Perceived level of success transaction
3. Perceived suitability of Tokopedia's claims about services
4. Perceived suitability of Tokopedia's promises about services

2.7. STATISTICAL HYPOTHESIS

The statistical hypothesis consists of the null hypothesis and the alternative hypothesis. The null hypothesis, or Ho, is a hypothesis that nullifies differences between groups or negates the relationship between variables. Meanwhile, an alternative hypothesis or Ha is a translation of the research hypothesis operationally. The alternative hypothesis is also called the working hypothesis (Azwar, 2005) . The alternative hypothesis related to diversity between groups, then the null hypothesis contains a declaration that negates the diversity. Based on the literature review above, in this research postulate the statistical hypothesis as:

H1:

Ho: Brand image does not affect positively and significantly e-Loyalty of Tokopedia users

Ha: Brand image affects positively and significantly e-Loyalty of Tokopedia users

H2:

Ho: Brand image does not affect positively and significantly e-Satisfaction of Tokopedia users

Ha: Brand image affects positively and significantly e-Satisfaction of Tokopedia users

H3:

Ho: Brand image does not affect positively and significantly trust of Tokopedia users

Ha: Brand image affects positively and significantly trust of Tokopedia users

H4:

Ho: e-Satisfaction does not affect positively and significantly e-Loyalty of Tokopedia users

Ha: e-Satisfaction affects positively and significantly e-Loyalty of Tokopedia user

H5:

Ho: Trust does not affect positively and significantly e-Loyalty of Tokopedia users

Ha: Trust affects positively and significantly e-Loyalty of Tokopedia users

H6:

Ho: e-Satisfaction does not positively and significantly mediate the effect of Brand Image toward e-Loyalty

Ha: e-Satisfaction positively and significantly mediate the effect of Brand Image toward e-Loyalty

H7:

Ho: Trust does not positively and significantly mediate the effect of Brand Image toward e-Loyalty

Ha: Trust positively and significantly mediate the effect of Brand Image toward e-Loyalty

CHAPTER III

RESEARCH METHOD

3.1. RESEARCH APPROACH

In order to gain scientific measured results, a research method is required. Research methods involve the form of data collection, analysis, and interpretation that research proposes for the studies (Creswell, 2014). Moreover, Sugiyono (2017) stated that the research method is a scientific way in order to obtain data for specific purposes.

The precise method selection likely helps to simplify the research process in order to reach the desired goal. There are two kinds of research approaches, those are quantitative and qualitative approaches. The quantitative approach uses the mathematical formula method, specifically in statistics form as the main approach to withdrawing the conclusion of the research, moreover, it is suitable for causal variable relationships (Siswanto and Sugiyono, 2018). Meanwhile, the qualitative approach uses an artistic method, because the research process more likely an art, moreover, it is suitable for reciprocal variable relationships (Sugiyono, 2017). According to that, this research uses the quantitative approach in order to analyze the influence of e-satisfaction, trust, and brand image toward the e-loyalty of Tokopedia users. The quantitative method is chosen due to its capability to test the hypothesis proposed (Sugiyono, 2017). Moreover, the quantitative approach supports causal variable relationship research.

3.2. UNIT OF ANALYSIS

The unit of analysis is the unit studied which can be an individual, group, object, or a social event such as an individual or group activity as a research subject. According to Labaree (2009), there are five parts of the unit of analysis, such as individuals, dyads, groups, organizations, and culture.

The applied unit of analysis in this research is individual, thus every collected data come from each individual so does the processed data come from the individual data source. Hence, the unit analysis of this research is Tokopedia users as individuals.

3.3. POPULATION AND SAMPLE

3.3.1. POPULATION

A population is a group of people or residents who occupy a certain area. In statistics, the population refers to a group of individuals with distinctive characteristics that are of concern in a study (Siswanto and Suyanto, 2018). The population is a generalization area consisting of objects or subjects which possess a certain quantity and characteristics that are determined by the researcher to be studied and then draw conclusions (Sugiyono, 2017). Based on the definitions, the population of this research is all Tokopedia users from Indonesia only. According to Kumparan (2019), Tokopedia declared that its active monthly users reach 90 million unique users by 2019. This number comes from users in Indonesia only, due to Tokopedia's existing policy which is not planning to expand abroad yet (Siregar, 2019). Therefore, this number is referred to as the size of the population.

3.3.2. SAMPLE

A sample is part of the number and characteristics possessed by the population (Sugiyono, 2017). Sampling is done by selecting part of the population elements, conclusions about the entire population can be obtained (Siswanto and Suyono, 2018). The sample taken from the population must be representative in order to gain a good output. Instead of getting information from those who are most readily or easily available, it sometimes becomes necessary to obtain information from specific target groups (Sekaran and Bougie, 2016) . Hair Jr, et al (2014) stated that the number of samples as respondents must be adjusted to the number of question indicators used in the questionnaire, therefore, the formulation of the number of samples = n x 5 up to n x 10 whereas n is indicators. The indicators used in this research are 14 indicators, hence, the number of respondents is 14 indicators multiply to 8 equals 112 respondents.

In this research, the chosen sampling method is a purposive sampling method. The purposive sampling method is sampling with certain considerations (Sugiyono, 2017). Moreover, the sample is limited to whom they can provide the desired information, either because they are the only ones who have it, or according to some criteria set by the researcher. The followings are the criteria of the sample:

1. Y and Z generation users from Indonesia. According to Jiang (2019), the Y generation classified as millennial born in the 1980s and 1990s, which per 2020, the maximum age as Y generation is 40 years old. Meanwhile Z generation is the collegian and newly entered workforce which means 2000s. Y and Z generation selection due to the significant amount of

transactions of e-commerce generate by these generations. According to Muazam (2020) Y and Z generation made by 85 percent of the total e-commerce transactions in 2019.

2. Tokopedia users that purchased through Tokopedia for at least twice within the last two months. Repurchase describes the consequence of e-loyalty (Toufaily et al, 2013). In addition, Kuswanto et al (2020) stated that the frequency of online purchases in Indonesia for all gender is once a month, thus the possibility they conduct repurchase is within two months.

3.4. DATA SOURCE

According to Sugiyono (2017), a data source is where the data is obtained using certain methods, whether in the form of humans, artifacts, or documents. Data source in this research originating from external data which is Tokopedia users. Furthermore, based on the way it is collected, this research uses primary data. According to Sugiyono (2017), primary data means the data source that is given directly to data collectors.

3.5. MEASUREMENT SCALE

In research, the variable's score measured by the research instrument, herewith causes the amount of research instrument rely on the studied variable. Sekaran and Bougie (2016) stated that there are four basic types of scales: nominal, ordinal, interval, and ratio.

The interval scale is applied for this research which has an absolute distance between variables. Many attitude scales are presumed to be interval, Likert scales can indeed be analyzed effectively as interval scales (Sugiyono, 2017). Moreover, the Likert scale applied to measure attitudes, opinions, and individual or group perceptions about social phenomena. Furthermore, the social phenomena itself is appointed specifically by the researcher, hereinafter referred to as a research variable. Hence, the Likert scale is applied in the questionnaire. This research is measured by a Likert scale with a 1-5 scale. In terms of quality of measurement, 5-point scales yield better quality data (Revilla et al, 2014). The Likert scale can be seen below

- Strongly disagree – 1
- Disagree – 2
- Neutral – 3
- Agree – 4
- Strongly Agree – 5

3.6. VALIDITY AND RELIABILITY INSTRUMENT

The instrument for the questionnaire consists of three indicators that self-proposed. Therefore, the required validity and reliability test to self-proposed indicator. According to Siswanto and Suyono, (2018), in order to conduct a validity and reliability test, it is required at least 30 respondents of 114 total target respondents, because of its score close to the normal curve.

3.6.1. VALIDITY TEST

The validity test indicates how close the measurement tool represents what it is supposed to measure (Siswanto and Suyono, 2018). The test method used is the product-moment correlation technique. The interval score of each question item that tested its validity is correlated to the interval score of whole items. The tool is valid if the correlation coefficient is equal to or higher than 0.192. Vice versa. The number chosen in order to yield more valid tool, which the correlation coefficient that produce from 5% level of significant and 114 samples of Pearson Product Moment Table is 0.192.

The test used the answers of all respondents. The followings are the result of validity test for every items.

Table 3.1. Validity test result

Variable	Item	Sig	Result
Brand Image (X)	Perceived popularity of Tokopedia	0.000	Valid
	Perceived good reputation of Tokopedia	0.000	Valid
E-Satisfaction (M1)	Perceived of ease of use of the application	0.000	Valid
	Perceived enjoyment within a transaction in Tokopedia	0.000	Valid
	Perceived conformity of expectation	0.000	Valid
	Perceived suitability of the service	0.000	Valid

Trust (M2)	Perceived accountability of the transactions' security	0.000	Valid
	Perceived level of success transaction	0.000	Valid
	Perceived suitability of Tokopedia's claims about services	0.000	Valid
	Perceived suitability of Tokopedia's promises about services	0.000	Valid
	Frequency in using Tokopedia for searching goods compare other e-commerce	0.000	Valid
E-Loyalty (Y)	Repurchase intention within the last two months	0.000	Valid
	Eagerness to switch to another e-commerce	0.000	Valid
	Positive e-WOM toward at least one acquaintance	0.000	Valid

Source: Primary data, 2020.

As seen in table 3.1., the entire of the indicators or questions X (Brand Image) have Sig. (0.000) < 0.05, thus, every brand image's question items are valid. Moreover, the entire of the indicators or questions M1 (e-Satisfaction) have Sig. (0.000) < 0.05, thus, every e-Satisfaction's question items are valid. The entire of the indicators or questions M2 (Trust) also have Sig. (0.000) < 0.05, thus, Trust's

question items are valid. Finally, the entire of the indicators or questions Y (Trust) have Sig. (0.000) < 0.05, thus, every e-Loyalty's question items are valid.

3.6.2. RELIABILITY TEST

The reliability test is to test the accuracy and consistency of the tool. The reliable measurement generates a constant score or closes even though the tool is tested multiple times (Siswanto and Suyono, 2018). The split-half method is applied due to its effectiveness to test a questionnaire-based test instrument (Siswanto and Suyono, 2018). The split-half method uses Spearman-Brown equation, that is:

$$rel: \frac{2r}{1+r}$$

Where:

rel : number of reliability

r : number of correlation of first section (X) and second section (Y)

The result subsequently is connected to r-table where r-reliability > r-table means the tool is reliable. The number of respondents tested is 114 and the level of significance is 5%, hence the r-table applied is 0.192.

The test method used is the split-half method which processed with SPSS. The all of respondents are used for this test. The following is the result of the reliability test on each variable.

As seen in table 3.2., brand image's coefficient value of Spearman-Brown (equal length) is 0.791 > r table (0.192). Therefore, the indicators are reliable and accurate for describing Brand Image. Moreover, E-Satisfaction's coefficient value of Spearman-Brown (equal length) is 0.850 > r table (0.192). Therefore, the indicators

are reliable and accurate for describing e-Satisfaction. Trust's coefficient value of Spearman-Brown (equal length) is 0.852 > r table (0.192). Therefore, the indicators are reliable and accurate for describing Trust. Finally, e-loyalty's coefficient value of Spearman-Brown (equal length) is 0.759 > r table (0.192). Therefore, the indicators are reliable and accurate for describing e-Loyalty.

Table 3.2. Reliability test result

Variable	r-Reliability	r-Table	Result
Brand Image	0.719	0.192	Reliable
e-Satisfaction	0.850	0.192	Reliable
Trust	0.852	0.192	Reliable
e-Loyalty	0.759	0.192	Reliable

Source: Primary data, 2020

3.7. DATA COLLECTION METHOD

The method for collecting data is a questionnaire. The questionnaire is a data collection technique by giving several questions or written statements to the respondent to answer (Sugiyono, 2017).

This research applies the electronic and online questionnaire. This method is selected due to rapid distribution, less time consuming, and vast reach (Sekaran and Bougie, 2016) . The questionnaire is made using Google form then distributed by sending links to respondents through two channels, email, and social media. The method for distributing the link is to distribute using the campus email facility to spread questionnaires to students. Meanwhile, distribution through social media can be done by placing a comment about the questionnaire link on each official Tokopedia account post on Twitter and Instagram. The distribution will be spread simultaneously until it reaches the minimum threshold of 112 respondents who meet

the sample's criteria. In case of a low participant response rate, the questionnaire will be distributed by the door to door. According to Agustini (2018) , a survey by knocking the door gives a 92.7% response rate instead of using email or mail which gives roughly a 1% response rate.

The data earned by distributing the questionnaire by social media and email. The way to distribute through social media by mentioning account who engaged to Tokopedia's official account, furthermore, the way to distribute through email is conducted by emailing the entire 2018 – 2020 batch of students. Thus, the responses collected are 404 respondents within a week, however, the usable data was only 114 respondents due to the filtering questions at the beginning of the questionnaire which responsible for this occurrence. However, the 114 respondents have exceeded the initial respondent target, which was 112 respondents.

3.8. DATA ANALYSIS METHOD

The data collected above will be processed to find out the result. Several test will be applied. The analysis will use SPSS. SPSS is applied for the following analysis:

3.8.1. DESCRIPTIVE ANALYSIS

Descriptive analysis is applied to find out the description of the data that has been collected through the instruments used objectively without drawing certain conclusions. This data description will explain the various demographic aspects of the respondents involved in the study. According to Husein, (2007), the score for

each item of the questionnaire submitted to the respondent can be calculated as follows:

$$\text{Scale Range} = \frac{\text{Highest point} - \text{Lowest point}}{\text{Total answer}}$$

$$\text{Scale Range} = \frac{5-1}{5} = 0.8$$

Table 3.3. Scale Range

Scale Range	Category
1.00 - 1.80	Very Low
1.81 - 2.60	Low
2.61 - 3.40	Moderate
3.41 - 4.20	High
4.21 - 5.00	Very High

Scale range as seen on table 3.3 is applied in order to determine how the trend towards the collected responses. If the average response is very high, it means that the response of the respondents tend to be positive in confirming the questionnaire items.

3.8.2. PATH ANALYSIS

AMOS 23 program is applied in order to conduct path analysis technique. The AMOS program was chosen due to its capability to analyze complex models seamlessly. Path analysis is considered to be the most appropriate in examining the direct and indirect effects between exogenous and endogenous variables. Path analysis can also be used to analyze the causal model that is proposed based on the

theory. According to Juanim (2004), path analysis requires the following assumptions:

1. The relationship between variables in the model must be linear, adaptive and normal.
2. Using sampling techniques to provide equal opportunities for each member of the population to be selected as a member of the sample.
3. The model used is compiled based on a certain theory which provides an explanation of the causal relationship between the variables studied.
4. Causal flow must be recursive or only one direction and there is no back and forth direction.
5. Measurable variables can be observed directly and all errors are not correlated with others.
6. The dependent variable is measured in a scale of measuring intervals and ratios.

3.8.3. CLASSIC ASSUMPTION TEST

A classic assumption test is needed to determine whether the results of the regression estimation being held are truly free of heteroscedasticity, multicollinearity, and autocorrelation. The regression model can be used as an unbiased estimation tool if it meets the BLUE (best linear unbiased estimator) requirements, that is, there is no heteroscedasticity, no multicollinearity, and no autocorrelation. If there is heteroscedasticity, then the variance is inconstant, thus, it possibly causes the bias standard error. If there is multicollinearity, it will be difficult to isolate individual effects from the variable, hence, the level of significance of the

regression coefficient is low. If there is autocorrelation, cause the estimator is remains biased and consistent, but it becomes inefficient (Priyatno, 2013).

The classic assumption test in mediating regression does not include interaction variables, because in the interaction variable there are elements of the independent variable and the mediating variable. This possibly causes problems in regression, especially multicollinearity, which can reach more than 80% (Liana, 2009). The classic assumption test needed consist of:

1. Normality test

   It is held in order to test whether the regression model and residuals in research has a normal distribution. Kolmogorov-Smirnov (K-S) test is applied. If the significance <0.05 means that the data to be tested has a difference from the standard normal data, in other words, means the data is not normal (Ghozali, 2016).

2. Multicollinearity test

   It is held to test whether the regression model found a correlation between independent variables (Ghozali, 2016). The multicollinearity test can be seen from the tolerance value and variance inflation factor (VIF). These two measures indicate which independent variable is explained by the other independent variables. Tolerance measures the variability of the independent variable selected which is not explained by other independent variables. So a low Tolerance value equals a high VIF value. These are the base of taking a decision:

- If the VIF value is below 10 or <10 and the Tolerance value> 10 percent, then there is no multicollinearity problem, meaning the regression model is good.
- If the VIF value is above 10 or> 10 and the Tolerance value is <10 percent, then there is a multicollinearity problem, meaning that the regression model is not good.

3. Heteroscedasticity test

It is held in order to test the regression model in the research where there is an inequality in the residual variants from one observation to another (Ghozali, 2016). Detection of the presence or absence of heteroscedasticity in this study can be done by looking at the presence or absence of certain patterns on the scatterplot graph between the SRESID residual and the predictive value of the dependent variable (dependent) ZPRED where the Y-axis is predicted Y, and the X-axis is residual (Y prediction - Y actually) which has been tested. The basis of the analysis used is (Ghozali, 2016):

- If there is a certain pattern, such as dots that make a certain regular pattern (wavy, widened then narrowed), then heteroscedasticity occurs.
- If there is no certain pattern, and the dots spread above and below the 0 on the Y axis, there is no heteroscedasticity.

3.8.4. GOODNESS OF FIT

Goodness-of-fit (GOF) indicates how good the particular model reproduces the observed covariance matrix among the indicator items (i.e., the similarity of the

observed and estimated covariance matrices) (Hair Jr et al, 2014). Moreover, Structural Equation Modelling have no any single fittest statistical test that can explain in predicting a model. Instead, the researcher developed several combinations of model fit measures that produced three perspectives, which are absolute measures, incremental measures, and parsimony fit measures.

Absolute fit measure

1. Chi Square (x2)

   Chi square test measures how close the implied covariance matrix (the predicted covariance matrix) and the sample covariance matrix (the covariance matrix of the data sample) is. A model is considered good if it has a relatively low chi-square value due to indicating of no difference.

2. GFI (Goodness of Fit Index)

   It is particularly a measure of the ability of a model to describe the diversity of data. The possible range of GFI values is 0 to 1, the higher values indicating is the better the model fit. If a model has a GFI value of more than 0.9, then the model is considered as a good model fit.

3. RMSEA (The Root Mean Square Error of Approximation)

   If the RMSEA value of a model is smaller or equal to 0.08, then the model shows a good suitability value based on degrees of freedom.

4. RMR (Roat Mean Square Residual)

   Lower RMR and SRMR values indicate a better fit and higher scores indicate a worse fit, which places the RMR, SRMR, and RMSEA into an index category

sometimes known as badness of fit measures where the higher value indicates a poor fit. The rule of thumb is that an SRMR above 0.1 indicates a fit problem.

Incremental Measure

1. Tucker Lewis Index (TLI)

It is an incremental fit index that provides a comparison between the model being tested and a baseline model. If the value obtained in the model shows more than 0.95, then the model is considered to have a good suitability score and a value that is very close to 1 is good fit.

2. Comparative Fit Index (CFI)

It is an improved version of Normed Fit Index. CFI that is close to 1 indicates the highest level of fit. The CFI score which is at 0.8 - 0.9 is a marginal fit, ≥ 0.9 is good fit.

Parsimony Fit Measure

1. Adjusted Goodness of Fit Index (AGFI)

AGFI is a modification of GFI by accommodating the degree of freedom model with other models being compared. AGFI can be adjusted against the existing degree of freedom to test whether or not the research model is acceptable. A good AGFI has a value of ≥ 0.90, if AGFI value is between 0.8 - 0.9 it can be considered as a marginal fit.

Table 3.4. Goodness of Fit Value

Goodness of Fit Index	**Cut of Value**
Chi Square	Expected smaller
GFI	≥ 0.90

RMSEA	≤ 0.08
RMR	≤ 0.10
TLI	≥ 0.95
CFI	≥ 0.90
AGFI	≥ 0.90

3.8.5. MEDIATING REGRESSION ANALYSIS

Mediating regression analysis is applied because the research wants to test the influence of an independent variable toward the dependent variable with the existence of two mediating variables. It is applied in order to see whether the mediating variable (e-Satisfaction and Trust) affects the influence between variable Brand Image, which is a variable that suppresses/explains other variables or called the independent variable on variable e-Loyalty (dependent variable). This influence can then be used to find the effect of variable Brand Image on variable e-Loyalty. Then observing whether the mediating variable (e-Satisfaction and Trust) affects the relationship between variable Brand Image and e-Loyalty.

The testing steps refer to the mediator role testing procedure proposed by Baron and Kenny (1986) are as follows:

1. Make a regression equation for Brand Image (X) on e-Loyalty (Y). This regression analysis generates a coefficient of C. This pathway was expected to be significant ($p < 0.05$).

   Equation I : $Y = \alpha 1 + CX$

2. Creating a regression equation for Brand Image (X) on e-Satisfaction and Trust (M). This regression analysis generates a coefficient A. This pathway was expected to be significant ($p < 0.05$).

   Equation II (e-Satisfaction) : $M(ES) = \alpha 2 + AX$

   Equation II (Trust) : $M(T) = \alpha 2 + AX$

3. Make a regression equation for Brand Image (X) and e-Satisfaction and Trust (M) towards e-Loyalty (Y). This regression analysis generates two predicted predictor values of M and X. The prediction of M against Y generates a coefficient of B, while the prediction of X against Y produces a coefficient of C'. Path B is expected to be significant ($p < 0.05$), while line C' is expected to be insignificant ($p > 0.05$).

   Equation III : $Y = \alpha 3 + C'X + BM$

Where:

Y = e-Loyalty

M = e-Satisfaction / Trust

X = Brand Image

α = The value of the regression constant coefficient

A = The regression coefficient value of Brand Image to e-Satisfaction / Trust

B = The regression coefficient value of e-Satisfaction / Trust towards e-Loyalty by controlling Brand Image

C = The regression coefficient value of Brand Image on e-Loyalty

C'= The regression coefficient value of Brand Image on e-Loyalty by controlling e-Satisfaction / Trust

The variable M is called a mediator if the following criteria are met:

Equation I, X significantly affects Y (or C ≠ 0)

Equation II, X significantly affects M (or A ≠ 0)

Equation III, M significantly affects Y (or B ≠ 0).

3.8.6. t TEST

The moderation regression coefficient test meant whether an individual the independent variable has a significant effect or there is no dependent variable. The hypothesis test used is the t-test. The t-test is held in order to determine the significant level of the independent variable individually towards the dependent variable. In other words, t Test is conducted for testing hypothesis 1, 2, 3, 4, and 5. The t-count equation as follows:

$$t = r\sqrt{\frac{n-2}{1-r^2}}$$

Where:

t = t test

r = Correlation coefficient

n = Number of samples

The level of significance chosen was 5% (α = 0.05) or with a level of confidence of 95% of the degree (df) = n-k-1. This number is precisely chosen to

represent the variable testing and is a level of significance that is often used in research. The rules of significance testing using the SPSS program are:

1. If the probability value of 0.05 is smaller or equal to the probability value of Sig or (0.05 ≤ Sig), then Ho is accepted and Ha is rejected, meaning it is not significant.
2. If the probability value of 0.05 is greater or equal to the probability value of Sig or (0.05 ≥ Sig), then Ho is rejected and Ha is accepted, meaning that it is significant.

3.8.7. F TEST

The level of significance chosen was 5% (α = 0.05) or with a level of confidence of 95% of the degree (df) = n-k-1. This number is precisely chosen to represent the variable testing and it is a level of significance that is often used in research. The decision making criterion is Ho is accepted if: $F_{count} \leq F_{table}$ and Ho is rejected if: $F_{count} \geq F_{table}$. The rules of significance testing using the SPSS program are:

1. If the probability value of 0.05 is smaller or equal to the probability value of Sig or (0.05 ≤ Sig), then Ho is accepted and Ha is rejected, meaning it is not significant.
2. If the probability value of 0.05 is greater or equal to the probability value of Sig or (0.05 ≥ Sig), then Ho is rejected and Ha is accepted, meaning that it is significant.

The research hypothesis to be tested is formulated into a statistical hypothesis following:

$$F = \frac{\frac{R^2}{k}}{\frac{(1-R^2)}{(n-k-1)}}$$

Where:

F = F test

n = Number of samples

k = Number of independent variables

R^2 = Coefficient of determination

3.8.8. INDIRECT EFFECT TEST WITH SOBEL TEST

Sobel test is applied, in order to find out the influence of e-Satisfaction as a mediating variable between Brand Image and e-Loyalty. In other words, it is applied in order for testing hypothesis 6 and 7. The sobel test equation can be seen as follows:

$$z = \frac{ab}{\sqrt{(b^2SEa^2) + (a^2SEb^2)}}$$

Where:

a = the regression coefficient of the independent variable on the mediating variable

b = the regression coefficient of the mediating variable on the dependent variable

SEa = standard error of estimation a

SEb = standard error of estimation b

Mediating effect occurs when the z > z table, which in this research 1.96 (significance level of α = 0.05).

In order to determine whether fully or partial mediation, then the indirect effect equation is applied. Where:

$$C = C' + AB$$

If the effect of X to Y decreases to zero after inserting M into the regression equation (or C' is not significant), then perfect mediation occurs. However, if the effect of the independent variable to the dependent variable decreases but is not equal to zero by including a mediator (or C' is significant), then partial mediation occurs.

3.8.9. COEFFICIENT OF DETERMINATION

According to Ghozali (2012), the coefficient of determination (R^2) is a tool to measure how far the model's ability to explain variations in the dependent variable. The coefficient of determination is between zero or one. The small value of R^2 means that the ability of the independent variables to explain the variation in the dependent variable is very limited. On the other hand, if the value is close to one, it means that the independent variables provide almost all the information needed to predict the dependent variables. The coefficient of determination can be calculated using the following formula:

$CD = r^2 x 100\%$

Where:

CD : Coefficient of Determination

r^2 : Correlation coefficient

The criteria for the coefficient of determination analysis are:

1. If CD detects zero (0), then the influence of the independent variable on the dependent variable is weak.
2. If CD detects one (1), then the influence of the independent variable on the dependent variable is strong