CHAPTER III

RESEARCH METHODOLOGY

3.1 General Description of Research Object

Siklus Refill Indonesia is a startup company that has initiated an environmental innovation (eco-innovation). Siklus Refill Indonesia was founded by a German citizen named Jane von Rabenau who is now the Chief Executive Officer of Siklus Refill Indonesia. She was concerned about two problems faced by Indonesia, namely environmental problems and daily economic problems. Siklus Refill Indonesia was then presented as a solution that could overcome these two problems at once. Since its establishment in April 2020, Siklus Refill Indonesia has launched an application-based platform that offers refill technology services for various consumer products.

Figure 3. 1 Siklus Refill Indonesia Offers Refilling Service for Consumer Products

Source: Siklus Refill Indonesia (n.d.)

Siklus Refill Indonesia offers refilling services for various consumer products that have a different concept from refill consumer needs products (FMCG) which are usually sold in conventional stores in general. The difference lies in the absence of single-use plastic packaging at all, which means that Siklus Refill Indonesia applies the zero-waste concept for its refill products. Consumers only need to provide reusable containers to be filled with ordered products. Through this service concept, Siklus Refill Indonesia seeks to reduce the production of single-use plastic waste from households, especially sachet packaging, which is becoming increasingly worrying over time. In addition, they also want to free consumers from the burden of packaging costs which are usually included in the product price, which makes the product price higher. In accordance with their tagline "Delivering change on every refill", Siklus Refill Indonesia hopes that the services they offer can bring changes that have a positive impact on the earth, especially in Indonesia.

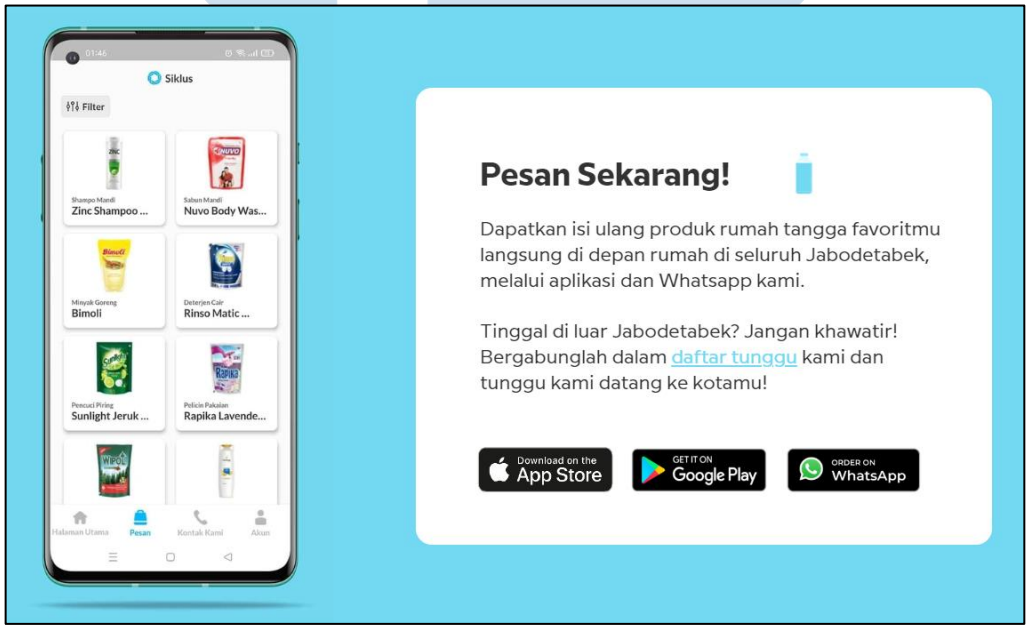

Figure 3. 2 Siklus Refill Indonesia Offers Their Service via Mobile App and WhatsApp

Source: Siklus Refill Indonesia (n.d.)

With the increasing popularity of internet-based shopping or online shopping in Indonesia and supported by the outbreak of the Covid-19 pandemic which limited

people's movement to travel at the time, Siklus Refill Indonesia combined its refill service with mobile application-based technology. Consumers can download it via Google Play Store or App Store. This is because Siklus Refill Indonesia wants its consumers to be able to shop for their consumer product needs easily and comfortably. Siklus Refill Indonesia will deliver consumer orders directly and refill them at consumers' homes after consumers place orders online through their applications or WhatsApp so consumers do not need to go to physical stores specifically to make purchases.

Figure 3. 3 Siklus Refill Indonesia's Service
Source: Siklus Refill Indonesia (n.d.)

Siklus Refill Indonesia has partnered with leading FMCG companies in Indonesia, such as P&G, Nestle, Wings, Mars, Total Chemindo Loka, Godrej, and Reckitt Benckiser until now. The consumer products offered by Siklus Refill Indonesia also vary, ranging from home cleaning products, personal care, and cooking needs to other household needs. The prices charged for Siklus Refill Indonesia products are relatively lower (with an average range of 20 percent) compared to the market prices of products sold in conventional stores or retail

because these prices are no longer combined with packaging costs that are usually charged by the producer to consumer. Not only that, Siklus Refill Indonesia does not set a minimum purchase order and does not charge any fees for shipping products ordered by consumers. Until now, Siklus Refill Indonesia has distributed its services in several areas in Indonesia cities, including Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek), and hopes to further expand its coverage area in the future.

According to Jaiswal et al. (2021), market segmentation became the first, the primary base, and the key strategic approach in developing company marketing policies. Therefore, the researcher seeks to reveal the market segmentation of Siklus Refill Indonesia. Based on observations made by researchers, Siklus Refill Indonesia has a market segmentation that is more focused on women with an age range that tends to be around 20 years to 45 years. Housewives are one of the professions that are suitable for the market for household products offered by Siklus Refill Indonesia. In addition, considering the practicality offered and the specified delivery schedule, it is possible that people who have limited time to go shopping can also be Siklus Refill Indonesia's target market, such as employees. In terms of income, considering the goal of Siklus Refill Indonesia which is trying to reduce the "poverty tax" in the form of packaging costs and the use of a mobile application base for ordering, the target consumers are those in the middle-low to middle-up class. The values and lifestyles adopted by Siklus Refill Indonesia target consumers refer to their concern for environmental conditions, which is their life goal to achieve environmental welfare itself through real action movements that they can contribute to.

3.2 Research Design

Research design and implementation can be carried out once the definition and development of an approach to the problem have been implemented. The definition of the problem itself refers to a general statement and the identification of components specifically related to the problem in research (Malhotra, 2020). Meanwhile, the development of an approach to the problem refers to the process of

finding the cause of the problem with the approach of existing theories, which include the formulation of an objective or theoretical framework, analytical models, research questions, and hypothesis as well as identifying other required information. The design and implementation of research begin with formulating a research design.

The research design refers to a framework or blueprint for conducting research that details the procedures needed to obtain information to develop or solve the problem to be discussed (Malhotra, 2020). Research design is the basis of a research project which aims to ensure that the research project is carried out effectively and efficiently.

3.2.1 Research Design Type

According to Malhotra (2020), the research design is broadly classified based on its objectives into two main classifications, namely exploratory research design and conclusive research design. Research design classifications are depicted through Figure 3.4 below.

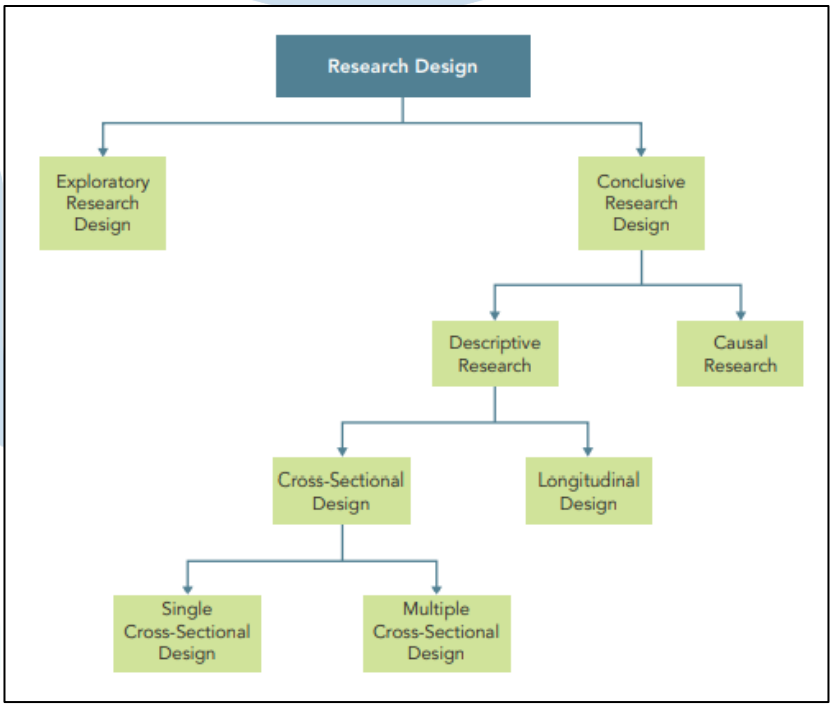

Figure 3. 4 Research Design Classifications
Source: Malhotra (2020)

Exploratory research design is a research design that explores the phenomena and problems discussed in research to provide related insights and understanding (Malhotra, 2020). This research design is used when researchers need to define in more depth the problem or phenomenon under study to gain additional general insight or information, which is usually flexible and unstructured, and identify relevant actions before an approach can be developed (Malhotra, 2020). The findings from exploratory research come from the analysis of primary data which is qualitative and the sample is relatively small in size and is not even representative (Malhotra, 2020). So based on this, exploratory research is usually considered only temporary, is tentative, and becomes an input in particular to develop hypothesis, priorities, key variables, and relationships in further research in the future, both further exploratory research and conclusive research (Malhotra, 2020).

Conclusive research design is a research design that tests assumptions and hypothesis, as well as examines certain relationships further to provide conclusions regarding a phenomenon, problem, or input from previous exploratory research (Malhotra, 2020). The resulting conclusions can then be used to help evaluate, provide input, and determine the best choice in the decision-making process, especially related to management (Malhotra, 2020). In contrast to the exploratory research design, this research design has a more formal and structured characteristic that is based on a large and representative sample with quantitative analysis (Malhotra, 2020). However, before conducting research, researchers need to collect and determine the information needed more clearly (Malhotra, 2020).

Based on its objectives, conclusive research designs are divided into two, including:

1. Descriptive Research

   Descriptive research is a type of conclusive research that has the main objective of describing a thing or phenomenon, such as the characteristics or functions of a market (Malhotra, 2020). This type of research can be useful for describing characteristics, estimating the

percentage of certain behaviors, determining perceptions, determining the relationship of variables, and making specific predictions (Malhotra, 2020). Descriptive research is planned and structured and is based on a relatively large and representative sample that is analyzed quantitatively (Malhotra, 2020). This descriptive research is characterized by the assumption that the researcher previously had sufficient knowledge, clear and detailed definitions and statements of information, or the formulation of certain hypothesis specifically about the situation of the phenomenon or problem because this research requires clear specifications, especially regarding who, what, when, where, why, and way (6W) in research (Malhotra, 2020).

2. Causal Research

Causal research is a type of research that has the main objective of proving a causal relationship between variables in a phenomenon (Malhotra, 2020). This research is also useful for understanding the causal variable (independent variable) and the effect variable (the dependent variable), as well as determining the nature and predicting the effect of the relationship under study (Malhotra, 2020). Causal research has the same characteristics as descriptive research in terms of a planned and structured design. However, this type of research cannot determine the degree of relationship between variables such as descriptive research, and for this purpose, there needs to be an examination that manipulates one or more causal or independent variables in a relatively controlled environment (Malhotra, 2020). The results of this study are based on the results of using the main method in the form of experiments (Malhotra, 2020).

Furthermore, Malhotra (2020) divides descriptive research into two divisions, including:

1. Cross-Sectional Design

Cross-sectional design is a type of descriptive research in which data and information collected from each sample in a certain population element are only carried out once in a certain period. In collecting data and information needed in this type of research, there are two types of designs that are divided based on their origin, namely:

a. Single Cross-Sectional Design

In this type of research, data and information collected at one time come from only one sample of respondents who are considered to be able to represent the population of respondents who are targeted in the study.

b. Multiple Cross-Sectional Design

This type of research collects data and information from two or more samples of respondents at once for each sample, where the collection time is often different in long intervals.

2. Longitudinal Design

Longitudinal design is a type of descriptive research in which data and information collected from each fixed sample in the population element are carried out repeatedly with the same variable, or in other words, the same sample is measured and studied with the same variable from time to time. If research with a cross-sectional design only provides a description at a certain time, this type of research aims to get a clearer and in-depth description of variables when they are in situations and changes that occur from time to time.

Based on the previous description, it can be concluded that in this study, the researcher used a Conclusive Research Design. This is because this study aims to test the hypothesis of the phenomenon raised in this study in order to get a conclusion, namely regarding the factors that influence consumers'

purchase intention towards consumer products in Siklus Refill Indonesia's service. This study uses Descriptive Research as a type of conclusive research design with the aim of describing phenomena that occur through a description of consumer characteristics, interrelationships of variables, and predictions related to the influence factors. Data collection was carried out once on the research sample through a survey by distributing questionnaires to respondents according to the criteria that became the research target. This explains that this study uses a Single Cross-Sectional Design.

3.2.2 Research Data

Based on its origin, research data is divided into two types (Malhotra, 2020). These are two types of research data, including:

1. Primary Data

   Primary data is data that comes from direct research with a specific purpose to overcome the problems at hand in research. This type of data collection involves a research process that usually takes time and is relatively more expensive. In collecting primary data, the methods used include in-depth interviews, focus group discussions, projective techniques, experiments, observations, and surveys.

2. Secondary Data

   Secondary data is data that has been collected previously and has been available to address other problems besides the problem at hand, or in other words problems from other research. In contrast to primary data, this type of data can be found in a shorter time, easier, and the costs required are relatively cheaper. This type of data can be obtained from the results of previous studies as well as from company databases. However, this data sometimes has limitations in terms of accuracy and relevance for the state of the current problem so it is sometimes less reliable.

In this study, researcher used both types of data, both primary and secondary data, as a source of reference data in conducting research. Primary data in this case refers to data collected through surveys by distributing questionnaires that include some questions to respondents according to the research target. In addition, the use of secondary data in this study was obtained from several news articles, journal articles, credible websites, and scientific books as sources of supporting data in this study.

3.3 The Scope of Research

Malhotra (2020) states that there are five stages in the sampling design process for research, each of which is closely related and relevant to all aspects of the research project.

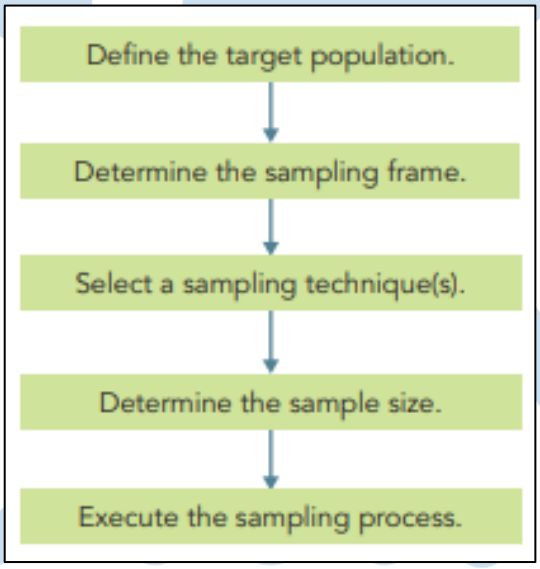

Figure 3. 5 The Process of Sampling Design

Source: Malhotra (2020)

Based on the description of the process in the Figure 3.5, the five stages are started by defining the population that is the target of the research. The second stage is the stage of determining the sampling frame, which is then followed by the stage of selecting the sampling technique that will be used in determining the sampling,

then the next stage is determining the size of the research sample, and ends with executing the sampling process.

3.3.1 Target Population

The target population itself is a collection of elements or objects that have information or become a source of information needed and sought by researchers to reach conclusions in research (Malhotra, 2020). Defining the target also involves the definition of the problem in the form of a statement and must be done properly to avoid ineffective research results and adverse effects. Four main aspects are included as part of defining the target population, including:

1. Element

   Elements are objects that have information that is the goal of searching or what is needed by researchers in research (Malhotra, 2020). In this study, the elements in question are respondents who participate in the process of collecting data and information through research questionnaires.

2. Sampling Unit

   A sampling unit is an element or aspect that includes available population elements and is in accordance with the criteria to be selected in several stages of the research sampling process (Malhotra, 2020). The sampling units in this study are:

   a. Women and men with an age range of 17 years and over
   b. Have awareness and concern for the environment
   c. Have purchased environmentally friendly products before
   d. Have relatives who have used environmentally friendly products
   e. Know about Siklus Refill Indonesia's services
   f. Have never purchased products from Siklus Refill Indonesia

3. Extent

The extent refers to the scope of research related to geographic boundaries in collecting research data and information (Malhotra, 2020). Considering that the object of research is a service from Siklus Refill Indonesia, which is a company originating from Indonesia, the geographical boundary for this research is the territory of Indonesia, especially the cities of Jakarta, Bogor, Depok, Tangerang, and Bekasi, the coverage area where Siklus Refill Indonesia has been operating during the time.

4. Time

In this case, the time factor refers to the period of time considered in collecting data and information for research (Malhotra, 2020). In connection with this research, the duration of this research is approximately four months, starting from February 2022 to June 2022. In distributing the questionnaires, the researcher did it in April 2022.

3.3.2 Sampling Frame

The sampling frame is a series of lists or instructions that can be used to identify and represent all elements of the target population in the study (Malhotra, 2020). When the researcher does not have or cannot compile a list of sampling frames, the researcher needs to determine some guidelines that can identify the target population or by screening respondents when collecting data (Malhotra, 2020).

Regarding the sampling frame in this study, the researcher did not have population data that could be used as a sampling frame for research respondents, so the sampling frame for this study was declared non-existent. Researchers will conduct screening in data collection that is adjusted to the criteria of the target population.

3.3.3 Sampling Technique

The sampling technique is classified into two types, namely probability sampling and non-probability sampling (Malhotra, 2020).

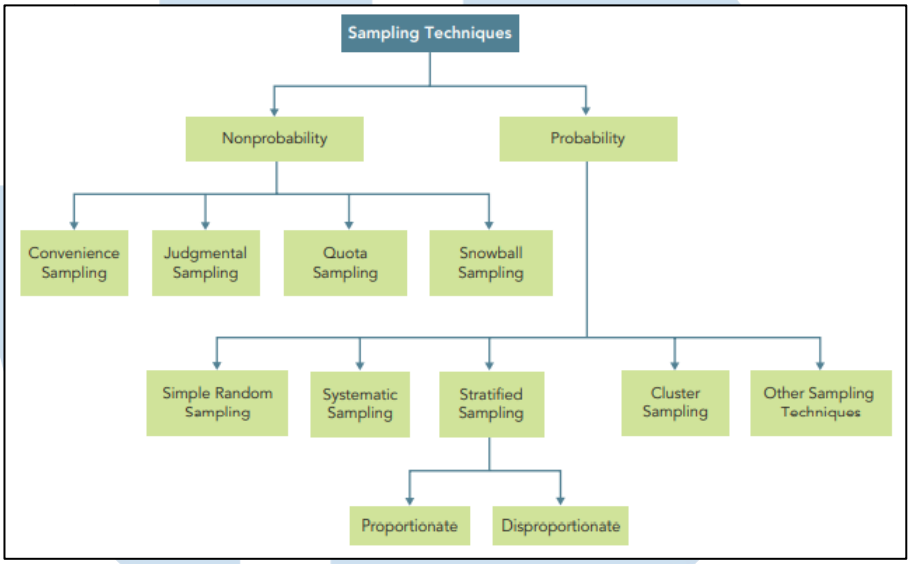

Figure 3. 6 The Classifications of Sampling Technique
Source: Malhotra (2020)

The probability sampling technique is a sampling technique in which each element of the target population has the same fixed opportunity to be selected as a sample, in other words, researchers have to know every element that has the potential to be randomly selected as a research sample (Malhotra, 2020). The sample size to be selected is adjusted to the definition of the target population and the general specifications of the sampling frame (Malhotra, 2020). In accordance with Figure 3.6, this sampling technique consists of five methods, which include simple random sampling, systematic sampling, stratified sampling, cluster sampling, and other sampling techniques.

The non-probability sampling technique is a sampling technique that is inversely proportional to probability sampling where the selection procedure is not random and is adjusted to the assessment of the researcher so that it can be said that each element of the population does not have the same

opportunity to be sampled (Malhotra, 2020). In this case, research usually does not have a sampling frame so that the researcher can determine it freely. This sampling technique is divided into four techniques, as shown in Figure 3.3, namely:

1. Convenience Sampling

   Convenience sampling is one of the sampling techniques that are least costly and time-consuming, where this technique obtains a sample of elements in the easiest way, which is adjusted to the choice of the researcher (Malhotra, 2020). Usually, the selected respondents are people who are in the same place and time as the researcher, so they are often considered accessible.

2. Judgmental Sampling

   Judgmental sampling is one of the sample selection techniques that is also based on the choice of the researcher where population elements are deliberately selected as samples because they are believed to represent or have conformity with the desired target population (Malhotra, 2020). This technique cannot generalize to a population but is usually used because the population cannot be defined explicitly or when conclusions from a broad population are not necessary.

3. Quota Sampling

   Quota sampling is a sampling technique that ensures that each sample has an even proportion with a quota and the assessment process consists of two stages (Malhotra, 2020). The first stage is the development of control categories or quotas according to the relevant control characteristics (such as gender, age, and race) of the target population elements, and the second stage is the stage of selecting sample elements based on the judgment or wishes of the researcher (convenience sampling or judgmental sampling).

4. Snowball Sampling

Snowball sampling is a sampling technique that selects a group of initial respondents at random and then takes the next sample based on references or information from initial respondents (Malhotra, 2020).

In this study, the sampling technique used is Nonprobability Sampling. This is because this study does not have a sampling frame so the elements of the target population of this study are not known. Therefore, the researcher will choose her own sample, using Judgmental Sampling, by the criteria that have been previously formulated which are considered to be representative of the target population of this study. This study will also utilize screening based on sample selection criteria so that it can be said that each element of the population does not have the same opportunity.

3.3.4 Sample Size

The sample size is the number of selected elements that will be included in the study (Malhotra, 2020). The sample size has a large influence and is considered to have an important role in testing in research because the number will have an impact on the level of parameter significance and sensitivity (Hair et al., 2019). Therefore, determining the sample size is often considered complicated and requires both qualitative and quantitative considerations (Malhotra, 2020).

Hair et al. (2019) state that there are several guidelines that have been developed regarding determining sample size, including based on:

1. The absolute size of the dataset

   In this case, the observation sample should not be less than 50 units or should be 100 or more.

2. The ratio of cases to variables

   Based on several guidelines, the number of samples to be observed should be at least five times larger than the number of

indicator variables to be analyzed and it would be better if it had a ratio of 10:1.

3. "Strength" of the results of the factor analysis

In accordance with this guideline, the sample size was determined based on the "strength" of the results of the exploratory factor analysis, particularly on communality.

Based on the guidelines that have been mentioned, where the sample size must have at least a 5:1 ratio compared to the indicator variable, it is assumed that the sample size is calculated by calculation (n × 5), i.e. "n" refers to the indicator variable which will be multiplied by 5. Therefore, this study has 29 question indicators, so according to the calculation (29 × 5), the minimum sample size that must be owned in this study is 145 respondents. This is also in accordance with the number one guideline where the sample size is more than 50 pieces.

3.4 Research Procedure

3.4.1 Research Period

The research period lasts from mid-February 2022 to mid-June 2022, which is equivalent to approximately four months. This research begins with the selection of objects and related phenomena, which is then carried out further investigation and preparation of the background and formulation of the problem accordingly. Then this research is continued with the elaboration and breakdown of related theories and previous studies. The research process continues with the process of formulating the research method, the process of collecting data along with its processing and continuing with the elaboration of research results. This research then ends by making conclusions and suggestions.

3.4.2 Data Collection

Primary data in this study was obtained using a questionnaire survey method created using Google Form. The questionnaires were then distributed online through various mobile instant messaging applications and social media platforms with the link https://bit.ly/SkripsiVinna to the respondents who were adjusted to the criteria of the target population in this study.

Secondary data in this study were obtained through several news articles, journal articles, credible websites, and scientific books that can be accessed by researchers. This secondary data is used as a source of supporting data in the study.

3.4.3 Research Process

In the research process, the researcher went through a number of procedures. The procedures are detailed as follows:

1. The researcher identified the phenomena and problems that will be raised in the study.
2. The researchers collected secondary data through various news sources, journal articles, scientific books, and various other sources that are used as sources of supporting information for research. Through the data collected, the researcher then carried out the preparation of the background, theoretical basis, hypothesis development, and framework research
3. The researcher selected and determined the frame of mind for this research with the sources of previous studies.
4. The researcher arranged questions that will be used as research questionnaire questions as a source of research primary data. The researcher searched for and selected journals as reference sources. The researcher also prepared questions by adjusting the words according to the right language order so that they could be more easily understood by the respondents.

5. Before proceeding to the main testing stage, the researcher distributed online questionnaires to a minimum of 65 respondents using Google Forms. The researcher conducted a pre-test on 50 respondents who had passed the screening and who managed to answer well. The pre-test was carried out related to validity and reliability using SPSS version 26 software.
6. After the pre-test results stated that all the indicators of this study were valid and reliable, the study continued with the main test. Data collection for the main test was carried out using a survey method through questionnaires distributed online via Google Form.
7. After all the data from the questionnaire were collected, then the data was processed using the Smart PLS software version 3.2.9, namely by measuring the measurement model and structural model.
8. The results of data processing and testing are then analyzed and interpreted to provide a decision on the research hypothesis.
9. Researchers draw conclusions and suggestions.

3.5 Variable Identification

3.5.1 Exogenous Construct

Exogenous variables are latent and multi-item variables that act as independent variables in a research model (Hair et al., 2019). These variables use various measures determined by factors outside the model in representing the construct and do not depend on other constructs in the model, so it is considered an independent variable (Hair et al., 2019).

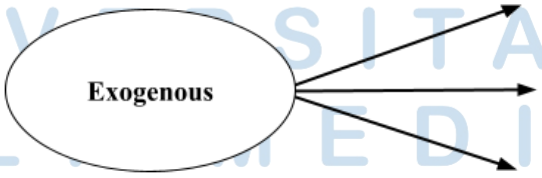

Figure 3. 7 Exogenous Construct
Source: Malhotra (2020)

As seen in Figure 3.7, exogenous variables are usually depicted as oval in shape, with arrows pointing outward and not having arrows pointing inward (Malhotra, 2020).

Exogenous variables from this study include Attitude, Subjective Norms, Environmental Consciousness, Perceived Behavioral Control, and Willingness to Pay.

3.5.2 Endogenous Construct

Endogenous variables are latent and multi-item variables that act as dependent variables in a research model (Hair et al., 2019). These variables are theoretically determined or based on other factors within the model or in other words, this variable depends on other models.

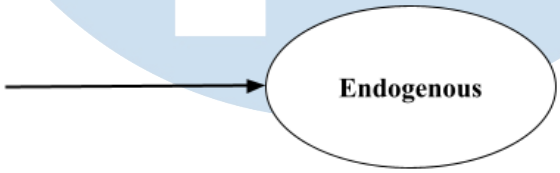

Figure 3. 8 Endogenous Construct
Source: Malhotra (2020)

According to Malhotra (2020), endogenous variables are usually depicted as ovals with one or more arrows pointing into them as seen in Figure 3.8. The direction of the arrow, which visually depicts the path from the exogenous construct to the endogenous construct, represents the dependence of this variable on other models (Hair et al., 2019).

The endogenous variable that is meant in this research is Purchase Intention.

3.5.3 Observed Variable

Observed variables are values that are observed or measured by researchers who present each dependent variable and independent variable in the research construction (Malhotra, 2020). These variables are also commonly referred to as measured variables, manifest variables, indicators, or construct items (Malhotra, 2020). These variables are assumed to be in the form of a question or statement which then measure the responses of the respondents. In general guidelines, each latent construct must have at least three observed variables to help identify the model (Malhotra, 2020).

In this study, there were a total of 29 questions (excluding profiling and screening questions) which were indicators or observed variables to represent the independent and dependent variables of this study, which included Attitude, Subjective Norms, Environmental Consciousness, Perceived Behavioral Control, Willingness to Pay, and Purchase Intention.

3.5.4 Scaling Techniques

Malhotra (2020) states that data measurement techniques are generally classified into two, including:

1. Comparative Scales

   Comparative scales are measurement techniques that involve direct comparisons between stimulus objects. This technique is also known as non-metric scaling which only has ordinal properties or ranking order. The comparative scale includes four types, including:

   a. Paired Comparison

      This scale includes selecting according to several criteria one of the two objects presented.

   b. Rank Order

      This scaling includes the process of sorting multiple objects simultaneously according to some criteria.

c. Constant sum scales

This scale uses the technique of allocating a constant number of units to a set of stimulus objects, especially for some criteria.

d. Q-sort and other procedures.

This scaling aims to make a fast and relatively large difference to a number of objects.

2. Noncomparative Scales

Noncomparative scales, also known as monadic or metric scales, are measurement techniques in which the scaling of each stimulus object in a set of stimulus objects is carried out independently which then produces data that is generally on an interval or ratio scale. In this technique, respondents are only asked to evaluate one object at a time and do not need to compare the assessed object with other objects or certain standards. This technique is divided into two types of scales, including:

a. Continuous Rating Scales

Continuous rating scales are graphical value scales where the measurement scale asks the respondent to rate an object by marking it at the appropriate position on a line that extends from one extreme of the criterion variable to another without any limitations.

b. Itemized Rating Scales

Itemized rating scale is a value scale that has a number or short description that represents each category sorted according to the position of the scale and asks respondents to rate the category and choose the one that best describes the object. This technique forms the basic components of a scale which are

usually more complex. Itemized rating scale is divided into three types, including:

- Likert Scales

  Likert scale is the most frequently used rating scale where the measurement uses five response categories, ranging from “strongly disagree” to “strongly agree”, which requires respondents to indicate a degree of their agreement or disagreement with each of a series of statements relating to the object of the stimulus. Data using this technique is usually treated as an interval scale that has the characteristics of description, regularity, and distance.

- Semantic Differential

  Semantic differential is a rating scale consisting of seven points with an endpoint associated with a meaningful bipolar label, which is usually a negative phrase on the far left and a positive phrase on the far right. Respondents were asked to rate objects through selection by marking one of the seven points between the two phrases.

- Staple Scales

  Staple Scale is a unipolar scale consisting of ten categories ranging from -5 to +5 with one adjective being in the middle of the value range without a neutral point (zero). Respondents were asked to rate how accurate or inaccurate each term was in describing the object being assessed by choosing the appropriate numeric response category, in other words, the higher the score, the more accurate it was.

In this study, the researcher uses the Noncomparative Scales because this study only examines one object independently, namely Siklus Refill Indonesia, and the assessment of the object under study does not depend on comparison with other objects. This study chose the Itemized Rating Scales with the Likert Scale method which consisted of 5 points in measuring the responses of respondents' approval and disagreement to the available statements relating to the object of this study. It also aims to avoid ambiguity and to give a clear and firm impression of each statement.

3.6 Operationalization of Variables

As stated in the explanation of the previous variables, it has been explained that this study has several variables that are used in solving research problems. Each variable has a definition and measurement indicators that are compiled using various theories that refer to the prior literature and journals that are relevant to the research topic.

In this study, there are six variables, including Attitude, Subjective Norms, Environmental Consciousness, Perceived Behavioral Control, Willingness to Pay, and Purchase Intention. Each measurement indicator of each variable is used as a question in the research questionnaire and uses a 5-point Likert scale measurement scale as a measuring tool, where a scale of 1 means a response of "strongly disagree" while a scale of 5 means a response of "strongly agree".

The definitions and indicators of each variable in this study are described in the Table 3.1 bellow:

Table 3. 1 Operationalization of Variables

No	Variable	Operational Definition	Measurement	Measurement (Bahasa)	Code	Scale	Reference
1	Attitude	Attitude is the level of assessment and evaluation, both positive and negative, on the benefits and performance related to purchasing behavior of environmentally friendly products (Al Mamun et al., 2018).	I prefer to buy refill products without packaging through Siklus Refill Indonesia which is more environmentally friendly than buying packaged products.	Saya lebih memilih membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia yang lebih ramah lingkungan dibandingkan membeli produk dengan kemasan.	ATT1	Likert 1–5	Al Mamun et al. (2018).
			Buying refill products without packaging through Siklus Refill Indonesia is an effort that needs to be done to help prevent global warming.	Membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia merupakan upaya yang perlu dilakukan untuk	ATT2		

				membantu mencegah pemanasan global.			
			Purchasing refill products without packaging through Siklus Refill Indonesia is more favorable.	Saya lebih menyukai membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	ATT3		
			I feel that buying refill products without packaging through Siklus Refill Indonesia is a good idea.	Saya merasa bahwa membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia adalah ide yang tepat.	ATT4		
			I feel that buying refill products without packaging through Siklus Refill Indonesia is safer.	Saya merasa bahwa membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia lebih aman.	ATT5		
2	Subjective Norms	Subjective norm is a belief or perception	People I listen to could influence me to	Orang-orang yang pendapatnya saya	SN1	Likert 1–5	T. I. Han & Chung (2014)

		held by a person that appears significantly because of the influence of their social environment, such as through friends, society, or family (Bong Ko & Jin, 2017a).	purchase refill products without packaging through Siklus Refill Indonesia.	dengarkan dapat memengaruhi saya untuk membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.			
			The people closest to me think that I should purchase refill products without packaging through Siklus Refill Indonesia.	Orang-orang terdekat saya merasa bahwa sebaiknya saya membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	SN2		
			Closest people in my life want me to purchase refill products without packaging through Siklus Refill Indonesia.	Orang-orang terdekat saya menginginkan saya untuk membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	SN3		
			My relatives think that purchasing refill	Kerabat saya merasa bahwa membeli produk	SN4		

			products without packaging through Siklus Refill Indonesia is a good idea.	isi ulang tanpa kemasan melalui Siklus Refill Indonesia adalah ide yang baik.			
3	Perceived Behavioral Control	Perceived behavioral control is a feeling related to the perceived ease or difficulty in carrying out a behavioral action that also reflects experiences from the past as well as obstacles to be anticipated (Paul et al., 2016).	I believe I have the ability to purchase refill products without packaging through Siklus Refill Indonesia.	Saya percaya saya memiliki kemampuan untuk melakukan pembelian produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	PBC1	Likert 1–5	Paul et al. (2016)
			If it were entirely up to me, I am confident that I will purchase refill products without packaging through Siklus Refill Indonesia.	Jika semua keputusan berada di tangan saya, saya yakin untuk melakukan pembelian produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	PBC2		

			I see myself as capable of purchasing refill products without packaging through Siklus Refill Indonesia.	Saya melihat diri saya mampu untuk melakukan pembelian produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	PBC3		
			I have resources, time and willingness to purchase refill products without packaging through Siklus Refill Indonesia.	Saya mempunyai sumber daya untuk melakukan pembelian produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.	PBC4		
			Siklus Refill Indonesia provides convenience in purchasing refill products without packaging.	Siklus Refill Indonesia memberikan kemudahan dalam pembelian produk isi ulang tanpa kemasan.	PBC5		
			I have plenty of opportunities to	Saya memiliki banyak kesempatan untuk	PBC6		

			purchase refill products without packaging through Siklus Refill Indonesia.	melakukan pembelian produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia.			
4	Willingness to Pay	Willingness to pay is the willingness of consumers to pay a certain amount of money, either at an affordable price or at a premium price, for the purchase of a particular product or service (A. Kumar et al., 2021).	I am willing to pay more to purchase more environmentally friendly products such as refill products without packaging through Siklus Refill Indonesia.	Saya bersedia membayar lebih untuk membeli produk yang lebih ramah lingkungan seperti produk isi ulang tanpa kemasan di Siklus Refill Indonesia	WTP1	Likert 1–5	Xu & Gursoy (2015)
			I am happy to pay more to purchase more environmentally friendly products such as refill products without packaging	Saya merasa senang (tidak masalah) untuk membayar lebih untuk membeli produk yang lebih ramah lingkungan seperti produk isi ulang	WTP2		

			through Siklus Refill Indonesia.	tanpa kemasan di Siklus Refill Indonesia			
			Most of my friends, family or relatives would be willing to pay more to purchase products that more environmentally friendly, such as refill products without packaging through Siklus Refill Indonesia.	Saya merasa teman, keluarga, maupun kerabat terdekat saya akan membayar lebih untuk membeli produk yang lebih ramah lingkungan seperti produk isi ulang tanpa kemasan di Siklus Refill Indonesia	WTP3		
			I will pay extra to purchase more environmentally friendly products such as refill products without packaging	Saya akan membayar lebih untuk membeli produk yang lebih ramah lingkungan seperti produk isi ulang tanpa kemasan di Siklus Refill Indonesia	WTP4		

			through Siklus Refill Indonesia.				
5	Environmental Consciousness	Environmental consciousness is a person's level of emotional involvement in environmental problems that can create affective responses related to environmental protection in the form of a desire or motivation to solve environmental problems by involving themselves in efforts to purchase products	I am worried about the worsening quality of the environment recently.	Saya mengkhawatirkan kualitas lingkungan yang semakin memburuk saat ini.	EC1	Likert 1–5	Naing (2020)
			The worsening environmental problem is one of the things I am concerned about.	Permasalahan lingkungan yang semakin memburuk menjadi salah satu hal yang saya perhatikan.	EC2		
			I am emotionally involved in environmental protection issues in Indonesia.	Saya merasa terlibat secara emosional dalam masalah perlindungan lingkungan di Indonesia.	EC3		
			I often think about how the environmental quality can be improved.	Saya sering memikirkan tentang upaya untuk memperbaiki kualitas lingkungan.	EC4		

		that are more environmentally friendly (Naing, 2020).	I take into account environmental consequences while buying household needs.	Saya mempertimbangkan konsekuensi terhadap lingkungan ketika membeli kebutuhan rumah tangga.	EC5		
6	Purchase Intention	Purchase intention is the desire possessed by consumers who contribute to the consideration and decision-making process regarding the selection and purchase of products that are more environmentally friendly than other conventional or traditional products (Naing, 2020).	I will consider purchasing refill products without packaging through Siklus Refill Indonesia because they are less polluting in coming times.	Saya akan mempertimbangkan untuk membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia di masa mendatang karena lebih tidak berpolusi.	PI1	Likert 1–5	Paul et al. (2016)
			I will consider switching to purchasing refill products without packaging through Siklus Refill Indonesia for ecological reasons.	Saya akan mempertimbangkan untuk beralih ke pembelian produk isi ulang tanpa kemasan melalui Siklus Refill	PI2		

				Indonesia karena alasan lingkungan.			
			I plan to spend more on environmentally friendly products, such as refill products without packaging through Siklus Refill Indonesia, rather than conventional products.	Saya berencana untuk membeli lebih banyak produk ramah lingkungan, seperti produk isi ulang tanpa kemasan di Siklus Refill Indonesia, dibandingkan dengan produk dalam kemasan konvensional.	PI3		
			I expect to purchase refill products without packaging through Siklus Refill Indonesia in the future because of their positive environmental contribution.	Saya akan membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia karena pertimbangan akan kontribusi positif mereka untuk perbaikan lingkungan.	PI4		

			I definitely want to purchase refill products without packaging through Siklus Refill Indonesia in the near future.	Saya yakin akan membeli produk isi ulang tanpa kemasan melalui Siklus Refill Indonesia di masa yang akan datang.	PI5		

3.7 Data Processing

3.7.1 Pretest

The pretest is the testing stage of the questionnaire data obtained by researchers using a small sample of respondents (Malhotra, 2020). The pretest must target respondents with the same criteria as the target population in the actual study (Malhotra, 2020). The implementation of the pretest aims to find out and identify potential problems faced by researchers and to eliminate the potential problem before the questionnaire is distributed to a large number of respondents (Malhotra, 2020). The size of the small sample in question is based on the heterogeneity of the target population, which usually ranges from 15 to 30 respondents, but the size can increase if the pretest involves several stages or waves (Malhotra, 2020).

3.7.1.1 Validity Test

A validity test is defined as a rating scale that measures the extent to which the observed difference in scale scores can reflect actual differences between objects on the measured characteristics, not systematic or random errors (Malhotra, 2020). Or in other words, the validity test is the stage of measuring the extent to which the scale or set of measures used in research can accurately represent a particular concept (Hair et al., 2019).

According to Malhotra (2020), there are three types of validity assessments, including:

1. Content Validity

   Content validity is a form of evaluation that is carried out effectively but remains systematic in nature regarding the assessment of the content of the measurement scale in representing the existing measurement task.

2. Criterion Validity

Criterion validity is a type of validity that will reflect on the suitability of the measurement scale performance in research with the expected expectations where other variables are chosen as comparisons.

3. Construct Validity

Construct validity is a type of validity that provides answers to questions measured by a measurement scale regarding a construct or characteristic.

In this study, the type of validity test used is Construct Validity, where the researcher uses question indicators that are used as a measuring tool in measuring a variable. The validity of an indicator can be known if the results of the indicator test are capable to meet several existing parameters. Referring to Hair et al. (2019), the validity test parameters in question are listed in the Table 3.2, as follows:

Table 3. 2 The Validity Test Parameters

No	Parameter	Rule of Thumb
1	**Kaiser-Meyer-Olkin (KMO) test of sampling adequacy** It is an index of validity measurement carried out to test the feasibility of factor analysis (Malhotra, 2020).	KMO value ≥ 0.5 • KMO value between 0.5 and above indicates that the factor analysis is appropriate, adequate, and valid. • The KMO value below 0.5 indicates that the factor analysis is not appropriate, inadequate, and invalid.
2	**Bartlett's Test of Sphericity**	Significant value < 0.05

	Is a test indicator that tests that variables are not correlated or related in a population (Malhotra, 2020).	The perfect correlation of the variables will be indicated by a significant value of r = 1, while the absence of correlation will be indicated by the value of r = 0. A significant value < 0.5 means that there is a significant correlation between one variable and another, so it can continue the next process.
3	**Factor Loadings of Component Matrix** This is a simple correlation test between variables and their factors (Malhotra, 2020).	Factor Loading of Component Matrix ≥ 0.5 Value ≥ 0.5 or more ideal if the value > 0.7 indicates that the observed variables meet in the same construct so that it is considered valid.
4	**Anti-image Correlation Matrix** An indicator to see the extent to which the factors of each variable explain each other in the results of factor analysis (Hair et al., 2019).	Measure of Sampling Adequacy (MSA) value ≥ 0.5 - 1 • MSA value on the diagonal Anti Image Correlation • MSA value = 1, indicating the variable can be predicted without any errors from other variables • MSA value ≥ 0.5, indicating the variable can still be predicted and processed further • MSA value < 0.5, indicating the variable cannot be predicted and processed further.

Based on Malhotra (2020), construct validity includes three different forms of theory in answering theoretical questions in the assessment, which are divided into:

1. Convergent Validity

Used in measurements aimed at finding out the extent of the scale can be positively correlated with other measures of the same construct. Convergent validity has two criteria related to outer loadings and Average Variance Extracted (AVE).

2. Discriminant Validity

Used to measure the extent to which there is no or no correlation with other constructs that should be different or have a unique contribution. Discriminant validity uses two criteria related to the cross-loading factor and the Fornell-Larcker criteria.

3. Nomological Validity

Used to measure scale correlation in a theoretically predictable manner with different but related construct measures. Nomological validity is used when several constructs are systematically related to each other.

Table 3. 3 Convergent Validity and Discriminant Validity Test Parameters

No	Parameter	Rule of Thumb
1	Convergent Validity	**1. Outer Loadings** → Outer Loadings value ≥ 0.7 **2. Average Variance Extracted (AVE)** → AVE value > 0.5
2	Discriminant Validity	**1. Cross Loading Factor** → Cross Loading Factor value ≥ 0.7 towards the variable itself **2. Fornell-Larcker Criterion** → √AVE value must be higher than the correlation between latent constructs

3.7.1.2 Reliability Test

After conducting a validity test, the next process to ensure the accuracy of a measurement is to perform a reliability test. A reliability test refers to a test that measures the consistency of the measurement scale when tested repeatedly (Malhotra, 2020), or in other words knowing the level of reliability of the measurement scale to measure indicators without errors.

In conducting the reliability test, the test results are based on consistency in certain conditions concerning Cronbach's Alpha. If the number of Cronbach's Alpha exceeds 0.6 (≥ 0.6), then the indicator can be declared reliable (Malhotra, 2020).

3.7.2 Main Test

In processing and analyzing data, this research uses the Structural Equation Modeling (SEM) method. This method is a procedure that aims to estimate or approximate a series of dependency relationships between a set of concepts or constructs that will be represented by several measurable variables and incorporated into an integrated model (Malhotra, 2020). According to Hair et al. (2019), Structural Equation Modeling (SEM) is a statistical model that aims to analyze and provide an explanation of each relationship of several dependent variables. In general, this method is used in conducting research on the reciprocal structure expressed in a series of structural equations, where this method is confirming and providing validation for a theory or research model (Malhotra, 2020).

According to Hair et al. (2019), this method has two different approaches, namely covariance-based and variance-based. Covariance-based SEM (CB-SEM), is the SEM method that is based on a general analysis of variance and begins by calculating the covariance matrix from previous research theories or models that have been strongly able to determine and distinguish which independent variables can predict each dependent variable (Hair et al., 2019). The CB-SEM method usually uses software in the form of

LISREL, AMOS, Mplus, EQS, and lavaan (Hair et al., 2019). Meanwhile, variance-based SEM, or commonly known as Partial Least Squares Structural Equation Modeling (PLS-SEM), is an alternative approach that is based on the analysis of total variance and focuses on maximizing the explained variance of endogenous latent variables, in which theory and previous research models make it possible to distinguish which independent variables can predict each dependent variable (Hair et al., 2019). The PLS-SEM method usually uses PLSGraph, SmartPLS, and other software (Hair et al., 2019). A clear difference between the two also lies in the focus of each method, where CB-SEM focuses on confirming established theories and PLS-SEM focuses on predicting and explaining relationships (Hair et al., 2019).

This study uses the Partial Least Square Structural Equation Modeling (PLS-SEM) method because the purpose of this study itself is to determine the relationship and explain the relationship between the independent and dependent variables, which include Attitude, Subjective Norms, Environmental Consciousness, Perceived Behavior Control, Willingness to Pay, and Purchase Intention.

3.7.2.1 Structural Equation Modeling (SEM) Stages

According to Hair et al. (2019), in carrying out the processing and analysis of PLS-SEM, there are six stages that must be passed relating to the terminology and procedures of PLS-SEM. The six stages are depicted in Figure 3.6.

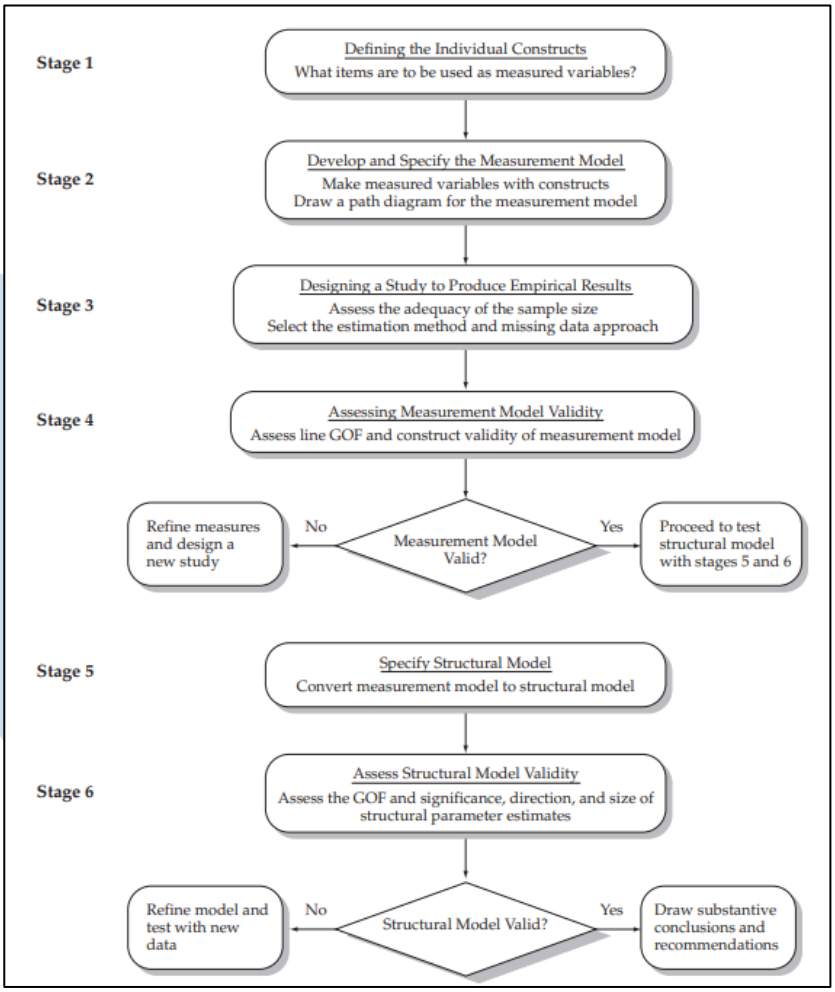

Figure 3. 9 Six Stages of PLS-SEM

Source: Hair et al. (2014)

According to Figure 3.9, the six stages include:

1. Defining the research objectives and selecting the constructs used to measure each variable
2. Designing research to achieve empirical results
3. Determining measurement models and structural models
4. Measuring validity and reliability of the measurement model used
5. Conducting an assessment of the structural model
6. Conducting further analysis

Broadly speaking, the PLS-SEM testing in these stages is classified into three major parts, including the suitability of the measurement model (outer model), structural model fit (inner model), and testing research hypothesis.

3.7.2.2 Measurement Model Fit

The measurement model in PLS-SEM is often referred to as the outer model. The measurement model itself is defined as a series of components in a theoretical path model that includes indicators and their relationship to the construct (Hair et al., 2019). Measurement models are also often referred to as latent constructs or latent variables because they are represented by observed or measured variables (Hair et al., 2019).

Measurement models are generally divided into two types, namely reflective and formative (Hair et al., 2019). The reflective measurement model is a measurement model that has a construct that is directly related to the indicator and makes the indicator a representation of the construct (Hair et al., 2019). The relationship between indicators and constructs in this model is depicted by arrows from constructs to indicators. Meanwhile, the formative measurement model is a measurement model of the results of a linear combination of a set of indicators that are considered to create or cause a latent construct, where the indicator exists before the latent construct (Hair et al., 2019). In contrast to the reflective measurement model, the relationship between indicators and constructs in this model is represented by arrows from indicators pointing to constructs.

Based on the variables of this study, which have previously been described in Table 3.1, it can be concluded that there are six measurement models in this study. The six measurement models include:

1. Attitude

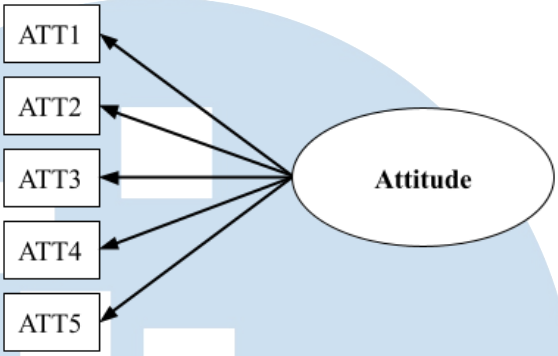

Figure 3. 10 Attitude Measurement Model

In this measurement model, there are five question indicators that play a role in representing the Attitude variable.

2. Subjective Norms

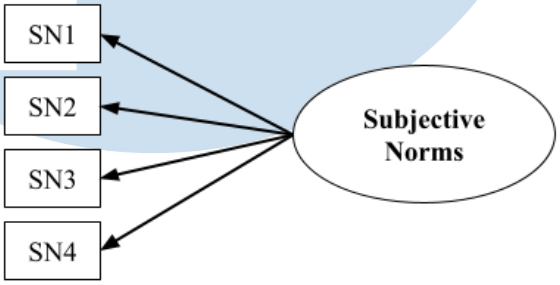

Figure 3. 11 Subjective Norms Measurement Model

In this measurement model, there are four question indicators that play a role in representing the Subjective Norms variable.

3. Perceived Behavioral Control

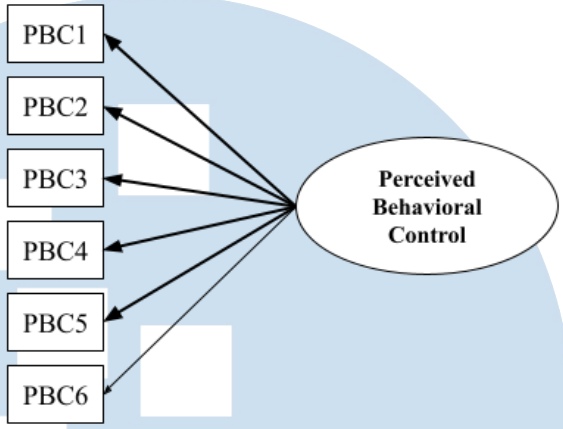

Figure 3. 12 Perceived Behavioral Control Measurement Model

In this measurement model, there are six question indicators that play a role in representing the Perceived Behavioral Control variable.

4. Willingness to Pay

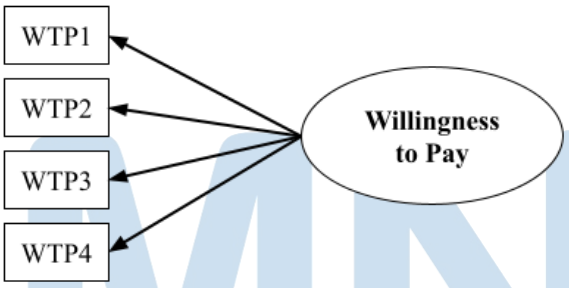

Figure 3. 13 Willingness to Pay Measurement Model

In this measurement model, there are four question indicators that play a role in representing the Willingness to Pay variable.

5. Environmental Consciousness

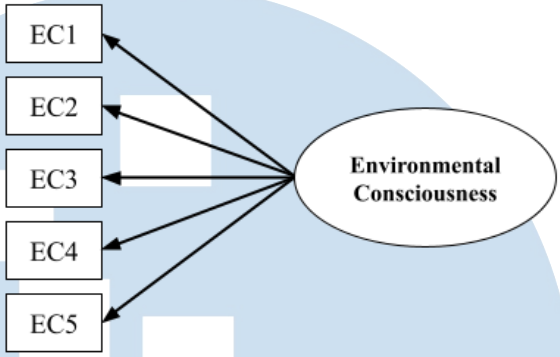

Figure 3. 14 Environmental Consciousness Measurement Model

In this measurement model, there are five question indicators that play a role in representing the Environmental Consciousness variable.

6. Purchase Intention

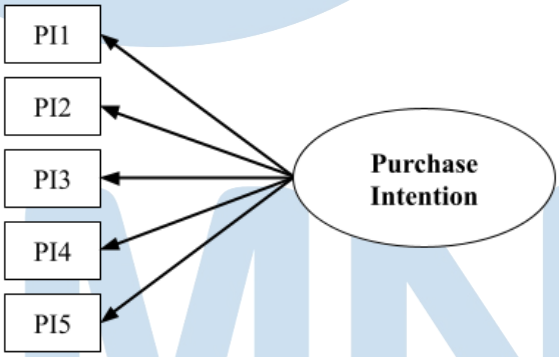

Figure 3. 15 Purchase Intention Measurement Model

In this measurement model, there are five question indicators that play a role in representing the Purchase Intention variable.

From the six measurement models in this study, it can be concluded that the measurement model used is a reflective research model. This is because the variables in this study represent and reflect the existing construction model.

Assessment of the measurement model is based on several parameters, including:

4.2.1 Indicator Loading

Loadings is an assessment that shows that the construct is able to explain indicator variance and shows acceptable item reliability (Hair et al., 2019). The rules of thumb are listed in the following table:

Table 3. 4 Indicator Loadings Assessment Parameter

Parameter	Rule of Thumbs
Outer Loadings	Outer Loadings ≥ 0.708 → Ideal

4.2.2 Convergent Validity

Convergent validity is an assessment metric that measures the extent to which indicators are able to explain item variance when constructs converge (Hair et al., 2019). The rule of thumb is based on the following conditions:

Table 3. 5 Convergent Validity Assessment Parameter

Parameter	Rule of Thumbs
Average Variance Extracted (AVE)	AVE ≥ 0.5

4.2.3 Discriminant Validity

Discriminant validity is an assessment that aims to evaluate the uniqueness of an indicator in representing a construct so that it is different from other constructs (Hair et al., 2019). The practical rules that determine it are in accordance with:

Table 3. 6 Discriminant Validity Assessment Parameters

Parameter	Rule of Thumbs
Cross Loading Factor	Cross Loading Factor ≥ 0.7 towards the variable itself
Fornell-Larcker Criterion	√AVE value must be higher than the correlation between latent constructs

4.2.4 Construct Reliability

Construct reliability is an assessment carried out to measure the consistency and reliability of each indicator (Hair et al., 2019). The rule of thumb is based on the following conditions:

Table 3. 7 Construct Reliability Assessment Parameter

Parameter	Rule of Thumbs
Cronbach's Alpha	Cronbach's Alpha > 0.7
Composite Reliability	Composite Reliability > 0.7
rho_A	rho_A > 0.7

3.7.2.3 Structural Model Fit

In accordance with the PLS-SEM stages proposed by Hair et al. (2019), an assessment of the structural model, or what is commonly referred to as the inner model, can be carried out after the research model has been confirmed to be valid and reliable through the measurement model assessment. The structural model is shown in a path diagram, which displays a set of hypothesis and variable relationships that explain the phenomena consistently and comprehensively to be estimated in research (Hair et al., 2019). The assessment of this structural model is carried out to know the ability of

the model used in predicting research phenomena and the relationship of each construct (Hair et al., 2019). In assessing the structural model, there are several parameters in carrying out the structural model:

4.2.1 Collinearity

The first step is to test collinearity, which is considered to have an influence on path coefficients. Collinearity is needed to avoid bias that may occur in the path coefficient when there is multicollinearity (Hair et al., 2019). This test relates to the value of the Variance Inflation Factor (VIF), a statistic related to the tolerance value. To get the VIF value in this test, the score of the latent variable of the exogenous construct is used as the input of the predictor construct in multiple regression (Hair et al., 2019). The VIF value should be lower than 3, and if it is above 5 it indicates that there is collinearity between constructs (Hair et al., 2019). In other words, the higher the VIF, the greater the degree of collinearity.

Table 3. 8 Collinearity Assessment Parameter

Parameter	Rule of Thumbs
Collinearity	VIF value < 5

4.2.2 Path coefficients

The next test carried out in the inner model stage is an assessment of the size and significance of the path coefficients. This assessment aims to test whether the structural model path, which functions in representing the theory of the research phenomenon, can interpret statistically meaningfully and how strong the relationship between constructs is (Hair et al., 2019). The bootstrap method is used in this test to obtain the level of

significance or probability (Hair et al., 2019). With this method, the assessment calculates:

a. Standard Coefficient (Beta)

The value of the standard coefficient estimates the relationship on the path in the structural model (Hair et al., 2019). This value ranges from -1 to +1, where +1 indicates a perfect positive relationship, 0 indicates no relationship, and -1 indicates a perfect negative relationship (Hair et al., 2019). This value indicates that each positive unit value represents an increase with the same value of standard deviation in the independent construct (Hair et al., 2019).

b. T-statistic

This value aims to test the level of significance for the partial correlation of variables as a hypothesis (Hair et al., 2019). This assessment is carried out by comparing the T value with the t-table value (normal distribution table) at the *alpha* level (significant level) or confidence interval (1-$\boldsymbol{\alpha}$) and certain degrees of freedom (df).

The formula for degrees of freedom (Hair et al., 2019):
df = N (Number of independent variables +1)

c. P value

This value aims to compare whether the value is below the significance level to confirm the hypothesis statement (Hair et al., 2019). P value < 0.05 indicates a significant effect so that the hypothesis can be accepted, and vice versa (Hair et al., 2019).

4.2.3 The coefficient of determination (R^2)

The coefficient of determination (R^2) is the level of predictive power in the data sample used (Hair et al., 2019). This measurement is especially important for PLS-SEM which focuses on prediction. The value of R^2 ranges from 0 to 1, where the larger the value, the better the construction prediction (Hair et al., 2019). A value of 0 indicates no relationship, while a value of 1 indicates a perfect relationship (Hair et al., 2019). However, the value of R^2 needs to be interpreted according to the context of the research being conducted.

Table 3. 9 Coefficient of Determination Assessment Parameter

Parameter	Rule of Thumbs
The coefficient of determination (R^2)	Value $R^2 = 0 - 1$ • $R^2 = 0.75 \rightarrow$ substantial • $R^2 = 0.50 \rightarrow$ moderate • $R^2 = 0.25 \rightarrow$ weak

4.2.4 The effect size (f^2)

The effect size (f^2) is one of the basic considerations that measure the probability of achieving statistical significance (Hair et al., 2019). The effect size (f^2) determines whether the observed relationship path is meaningful or in other words, has a correlation or a difference (Hair et al., 2019). In addition, this test also aims to evaluate the substantive impact on endogenous constructs or represent changes in the R^2. when any predictor construct is removed from the structural model (Hair et al., 2019). The value of f^2 has a standard parameter value, each of which

represents the magnitude of the effect of the exogenous construct.

Table 3. 10 The Effect Size Assessment Parameter

Parameter	Rule of Thumbs
The effect size (f^2)	• Value $f^2 < 0.02$ → no effect • Value $f^2 = 0.02$ → small effect • Value $f^2 = 0.15$ → moderate effect • Value $f^2 = 0.35$ → large effect

4.2.5 Blindfolding (Q^2)

Blindfolding (Q^2) is a test that assesses the predictive power or relevance of the model (Hair et al., 2019). The value of Q^2 indicates whether or not the prediction accuracy of the path model is acceptable for the observed construct (Hair et al., 2019).

Table 3. 11 Blindfolding Assessment Parameter

Parameter	Rule of Thumbs
Blindfolding (Q^2)	• Q^2 value > 0 → acceptable • Q^2 value < 0 → lack of predictive relevance

4.2.6 Goodness of Fit (GoF)

Goodness of fit (GoF) testing is usually carried out in the CB-SEM research approach. In PLS-SEM the GoF test was carried out with the aim of validating the structural model in overall combined performance. This test measures the effect that shows how good a model is. The formula used to test GoF is:

$$GoF = \sqrt{(\text{average AVE}) \times (\text{average Adjusted R2})}$$

Based on Hair et al. (2019), the GoF assessment parameters are divided into groups of small effects, medium effects, and large effects.

Table 3. 12 Goodness of Fit (GoF) Assessment Parameter

Parameter	Rule of Thumbs
Goodness of Fit (GoF)	• GoF = 0 – 0.25 → small effect • GoF = 0.25 – 0.36 → moderate effect • GoF > 0.36 → large effect

3.8 Hypothesis Testing

Hypothesis testing is carried out with several tests that have been mentioned in the test structural model. The tests in question include testing the path coefficient and size effect (f^2). In accordance with what was previously explained, then:

1. Standard Coefficient (Beta)

   The value of the standard coefficient aims to determine the nature of the relationship on the path and the value of one unit represents an increase or decrease with the same value as the standard deviation of the independent construct (Hair et al., 2019). The relationship will be positive if the value is > 0, the relationship is negative if the value is < 0, and the value of 0 indicates there is no relationship (Hair et al., 2019).

2. T-statistics and P value

   The decision to accept or reject the hypothesis is based on the results of the T value and P value (Hair et al., 2019). If the T value > t-table and P value < 0.05, then the hypothesis will be accepted, and if the T value < t-table and P value > 0.05, then the hypothesis will be rejected (Hair et al., 2019).

3. The effect size (f^2)

This value aims to measure the probability of achieving statistical significance and determine whether the observed relationship path is meaningful (Hair et al., 2019). In addition, the value of f^2 also represents the magnitude of the effect of the exogenous construct (Hair et al., 2019). According to Hair et al. (2019), the assessment parameters consist of: the value of $f^2 < 0.02$ (no effect), the value of $f^2 = 0.02$ (small effect), the value of $f^2 = 0.15$ (medium / moderate effect), and the value of $f^2 = 0.35$ (large effect).