CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Paradigm

According to Etikan & Bala (2017), educational research can be seen through three different approaches: positivism, interpretivism, and critical theory, which will be explained in the following paragraphs.

Positivism understands that there is a cause-effect relationship between phenomena and can be predicted once it is established. Reality is context-free, and every researcher will reach the same conclusion at a different time and place working on the same phenomenon. In positivism, researchers study the phenomenon independently without affecting and disturb what is being observed. This type of paradigm is mostly adapted for quantitative research.

Interpretivism is the reaction given over the over-dominance of positivism. Interpretivism believes that truth and reality are not discovered but created. The target of interpretivism research is to understand how individuals interpretation about a social phenomenon they interact. The social phenomenon is needed to be understood through the perspective of participants rather than the researcher. Therefore, qualitative research is done over an extended period.

Critical theory is used not to explain or understand society's phenomenon but to change it. The methodology used is through dialogue where it requires interaction between researcher and respondent to engage with the subjects to bring out a change in their perspective on the social system. Thus, in this paradigm, qualitative data is resulted.

This research follows the positivism paradigm because the research is done using a quantitative method, and the researcher does not interfere with the research object. Thus, the research procedures can be seen in Figure 3.1.

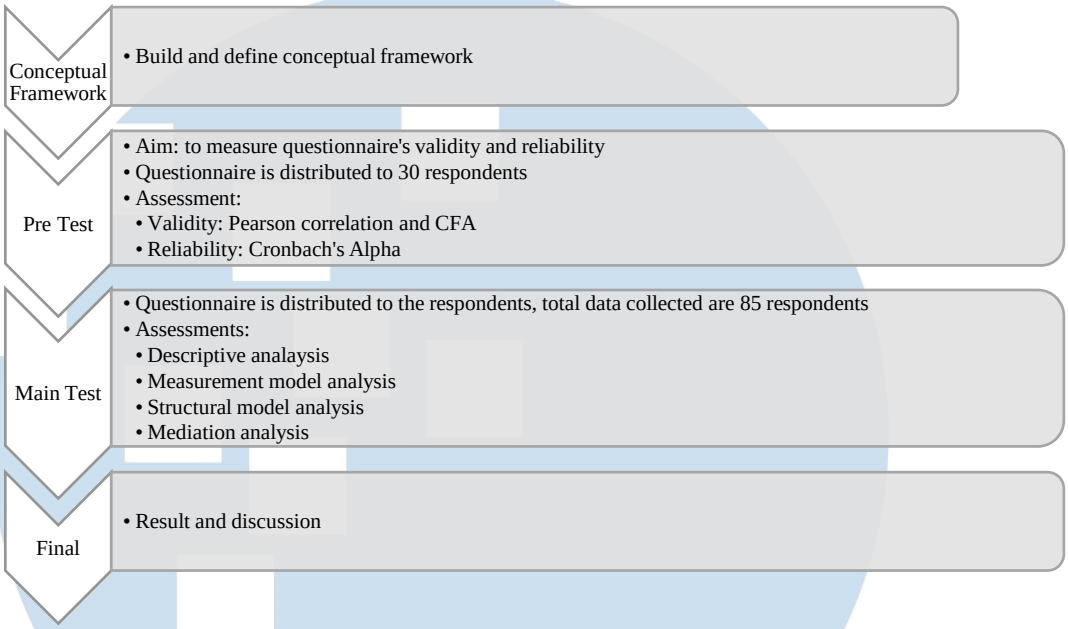

Figure 3.1 Research Procedures

3.2 Research Object

The research was conducted on PT. Health Today Indonesia which is one of beverages ingredients manufacturing company in Indonesia. The company focuses on the Horeca market, which is hotels, restaurants, and cafes; thus, the market segmentation of PT. Health Today Indonesia is a B2B customer. The target of the respondents will be customers of PT. Health Today Indonesia and research were conducted by distributing questionnaires using Google Form from July 13^{th,} 2021, to August 5^{th,} 2021.

3.3 Population and Sample

According to Taherdoost (2016), researchers might find difficulties collecting research data from all cases; therefore, the sample needs to be taken. The population is defined as the whole set of cases where the sample is taken. Time and source limitation hinders the researcher from analyzing the entire population; thus, a sampling technique was done to determine the number of cases brought.

A sample is an individual from a larger population. It is specifically selected through the sampling process to represent the whole population. The sample size is affected by the population size and the variation of variables used in the research. The minimum sample size should safeguard that the output of the statistical method; for instance, PLS-SEM has adequate statistical power. Less sample size may not significantly affect the population, and the researcher may commit a Type II error (Fitri et al., 2015).

According to Fitri et al. (2015), there are two sampling methods: non-probability sampling and probability sampling. Non-probability sampling is the procedure that does not bid a basis for any opinion that some elements will have a chance to present in the sample. Probability sampling, also known as random sampling, enables every single item to have an equal opportunity of presence in the sample. Types of sampling methods can be seen in Figure 3.2.

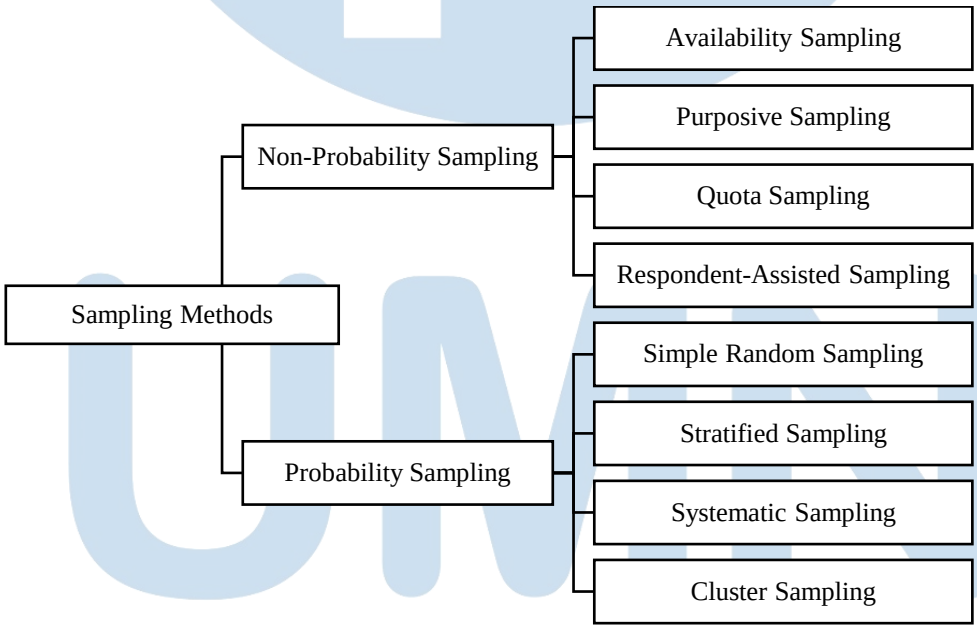

Figure 3.2 Types of Sampling Methods
Source: Daniel (2012)

According to Daniel (2012), one example of a non-probability sampling procedure is availability sampling. Availability sampling means the samples are

taken from the population based on availability, researcher's convenience, or self-selection. The advantages and disadvantages of availability sampling techniques can be seen in Table 3.1.

Table 3.1 Advantages and Disadvantages of Availability Sampling

Advantages	Disadvantages
Simplest procedure	Less reliable
Fewer resources (time, fund, personnel) needed	Over representing the population element that is accessible, articulate, and visible
Less effort needed	Underrepresenting the population element that is not accessible, uncooperative, and hidden
Less sampling skills needed	Underestimate the variability of the population

Source: Daniel (2012)

This research has three arrows pointing to repurchase intention, which is the dependent variable. According to Hair et al. (2014), for a 5% significance level and the value of R^2 at least 0.25, the minimum sample size needed will be 37 respondents. The guidance in determining the minimum sample size can be seen in Figure 3.3.

Maximum Number of Arrows Pointing at a Construct (Number of Independent Variables)	Significance Level											
	10%				5%				1%			
	Minimum R^2				Minimum R^2				Minimum R^2			
	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75	0.10	0.25	0.50	0.75
2	72	26	11	7	90	33	14	8	130	47	19	10
3	83	30	13	8	103	37	16	9	145	53	22	12
4	92	34	15	9	113	41	18	11	158	58	24	14
5	99	37	17	10	122	45	20	12	169	62	26	15
6	106	40	18	12	130	48	21	13	179	66	28	16
7	112	42	20	13	137	51	23	14	188	69	30	18
8	118	45	21	14	144	54	24	15	196	73	32	19
9	124	47	22	15	150	56	26	16	204	76	34	20
10	129	49	24	16	156	59	27	18	212	79	35	21

Figure 3.3 Guidelines in Minimum Sample Size Determination
Source: (Hair et al., 2014)

The population of this research will be all B2B customers from all industries, and the sample will be the customer of PT. Health Today Indonesia.

3.4 Variable Operationalization

Variables are involved during research. There are various types of variables, and researchers need to understand each variable's difference and the usage of specific variables on a framework. Variable operationalization is crucial because it helps the researcher define each variable as some variables may not easily measure and strengthen the hypothesis (Tariq, 2015).

According to Hair et al. (2014), there are two measurement models: exogenous latent variable and endogenous latent variable. Exogenous latent variable means the constructs that explaining other constructs. On the other hand, constructs that are being described are called endogenous latent variables. Table 3.2 shows the variable operationalization for this research.

Table 3.2 Variable Operationalization

No	Variable	Definition	Indicator	Code	Scale
1	Customer experience	Customer experience is the accumulation of customer perception created during learning, acquiring, using, maintaining, and disposing of a product or service directly or indirectly (Jain et al., 2017).	Sensory Emotional Behavioral Intellectual Relational	CX1 CX2 CX3 CX4 CX5	Interval scale: (1): strongly disagree (2): disagree (3): neutral (4): agree (5): strongly agree
2	Customer Loyalty	Loyalty means regular purchasing certain products and services, recommending to others, and being immune to promotion from similar and brands from a competitor (Huang et al., 2019).	Continual use Product development Price concern Best product	CL1 CL2 CL3 CL4	Interval scale: (1): strongly disagree (2): disagree (3): neutral (4): agree (5): strongly agree
3	Customer Satisfaction	Customer satisfaction is when customer demand and goal have been completed with a high-quality product or service. Customer	Product quality Service quality Workshop facilities Sales PIC	CS1 CS2 CS3 CS4	Interval scale: (1): strongly disagree (2): disagree (3): neutral (4): agree (5): strongly agree

No	Variable	Definition	Indicator	Code	Scale
		satisfaction can be seen after the usage of the product (Harahap, 2018)	Match expectation Right decision	CS5 CS6	
4	Repurchase Intention	Repurchase intention is defined as an individual's judgment in obtaining a product or service again from the first time (Anh et al., 2020).	Satisfaction Future order Product custom Recommend	RI1 RI2 RI3 RI4	Interval scale: (1): strongly disagree (2): disagree (3): neutral (4): agree (5): strongly agree

3.5 Data Collecting Technique

The primary data is collected by distributing questionnaires using Google Form. An Interval scale is applied to the questionnaire to evaluate whether the respondents agree or disagree with the statements. Five points scales are used which are: (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; and (5) strongly agree. The value of interval scales can be evaluated using mathematical computation, including mean and standard deviation (Hair et al., 2014). Secondary data is collected through an interview with the sales manager of PT. Health Today Indonesia.

From the minimum sample size of 37, a pre-test will be conducted with 30 respondents to ensure the validity and reliability of the questions. Next, the questionnaire will be given to the remaining respondents for the main test.

3.6 Data Analysis Technique

3.6.1 Descriptive Analysis

Descriptive analysis is the first crucial step when conducting research and should be done prior calculating inferential statistical comparison. It is a part of good research practice and done to reduce the likelihood of presenting misleading results. The descriptive analysis result shows extensive data collection in a simple and organized manner, provides a foundation for statistical tests, describes the relationship between variables, and summarizes it (Kaur et al., 2018).

According to Mishra et al. (2019), three major types of descriptive statistics will be explained further in Table 3.3.

Table 3.3 Types of Descriptive Analysis

Types of Descriptive Analysis	Explanation	Data
Measures of Frequency	Frequency statistic is as simple as counting the appearance number of each variable. It is essential since it deals with the frequency and percentage.	- Frequency - Percent
Measures of Central Tendency or Measures of the First Order	Central tendency means the measures of the central location used to find out the representative value of a set of data. To compare two or more groups of data, the expected values of the distribution are compared.	- Mean (average) - Median (middle value when data sorted from smallest to most significant or vice versa) - Mode (data that has the most frequency)
Measures of Dispersion or Variation	This measure shows how the data is spread out in a data set. It gives the idea of homogeneity or heterogeneity of the data.	- Variance (square of standard deviation) - Standard Deviation (how data spread out from the mean value) - The standard error (approximate difference between sample mean and population mean) - Quartile (three-point that divide the data into four equal groups) - Interquartile Range (measures of variability, the difference between third and first quartile) - Percentile Range (99 points that divide data into 100 identical groups) - Coefficient of Variation (ratio of standard deviation to the average value)

Source: Mishra et al., (2019)

3.6.2 Pre-Test Data Analysis

3.6.2.1 Validity Test

According to Taherdoost (2016b), a validity test means how well the data collected covers the area of the research. Types of validity, including criterion, face, content, and construct validity, can be seen in Figure 3.4.

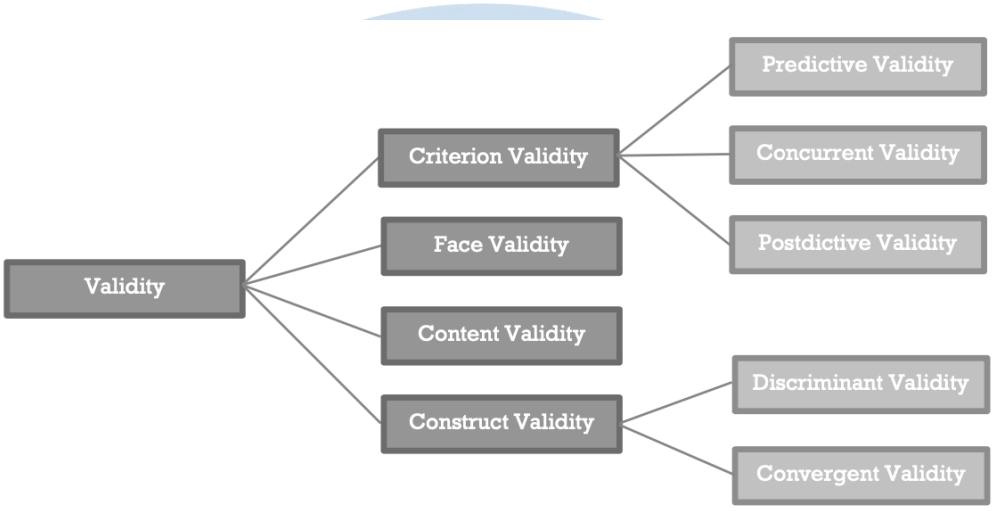

Figure 3.4 Subtypes of Validity Test

Criterion validity or concrete validity measures one measure's ability to predict the outcome for another measure. This kind of test is beneficial to predict the performance or behavior in other time situations (past, present, future). There are three types of criterion validity which are predictive validity, concurrent validity, and postdictive validity. Predictive validity is referred to when the test can predict what it is supposed to predict accurately. A long-term validity study is needed to establish predictive validity directly. Concurrent validity is defined as the evidence collected from the research to defend the use of a test in predicting another outcome. Postdictive validity has the criterion in the past (Taherdoost, 2016b).

Face validity is the degree where measures appear to be connected to a specific construct. It evaluates the questionnaire regarding appearance, style and formatting, feasibility, readability, and language. It is a subjective test on the items in the instrument whether the content is relevant, reasonable, obvious, and clear. A dichotomous scale, which is a “Yes” or “No” question, is used (Taherdoost, 2016b).

Content validity measures how an instrument echoes the content universe and what instrument needs to be generalized. Additionally, it involves evaluating the new instrument to ensure that items are essential and remove unnecessary items. Experts conduct the test to facilitate the validation; however, this limitation might interfere because the experts are staying in other countries (Taherdoost, 2016b).

Construct validity is done when there is a causal relationship between the constructs. Two components of construct validity are discriminant variability, which shows no relationship between constructs, and convergent validity, which states that measures have a relationship (Taherdoost, 2016b).

The Pearson correlation method is commonly used for validity tests. The value of Pearson correlation lies within the range of -1 (total negative correlation) to 1 (total positive correlation), where 0 means no correlation. For instance, a correlation of two variables (variable X and variable Y) was calculated at 0.7. It means both variables show a significant and positive relationship; therefore, if variable X increase as well as variable Y. On the other hand, a negative correlation shows the opposite relationship, which means that when variable X increases, variable Y will decrease (Nettleton, 2014). Obilor & Amadi (2018) added correlation coefficient is considered very low ($x < 0.4$), moderate ($0.4 < x < 0.6$), and high ($x > 0.6$).

According to Fisla (2019), the validity test can also be determined using the Confirmatory Factor Analysis (CFA) model. This factor is used to test the multidimensional form of a theoretical construct, and CFA will determine whether the indicators are valid to measure a latent construct. The validity test of the CFA model will observe the convergent validity or loading factor of each indicator. The recommended loading factor value is higher than 0.5.

3.6.2.2 Reliability Test

According to Taherdoost (2016b), the reliability test is related to repeatability, which means the test will be reliable if the repeat measurements result in the same results. A reliability test is crucial for research because it is attributed to the consistency of the instrument. Cronbach Alpha coefficient is one of the common methods used to analyze reliability. Four levels of reliability which are low reliability ($x < 0.50$); moderate reliability ($0.5 < x < 0.70$); high reliability ($0.70 < x < 0.90$); and excellent reliability ($x > 0.90$). However, it is suggested that reliability should be at least 0.60.

3.6.3 Main Test Data Analysis

According to Kante et al. (2018), Structural Equation Modelling (SEM) is a statistical technique used to analyze the causal relationship based on statistical data and qualitative causal assumptions. By utilizing SEM, the researcher can answer a set of interrelated research problems in single, systematic, and comprehensive analysis by simultaneously analyzing the connection and relationship between multiple dependent and independent constructs.

According to Utomo & Budiastuti (2019), SEM analysis is a second generation multivariate analysis that allows some assessments including multiple independent and dependent construct, multi-step paths, and mediating and moderating effect. SEM can also observe a high complexity latent variables and examine a non-normally distributed data.

There are two types of SEM: Partial Least Squares (PLS) and Covariance Based (CB). CB-SEM requires confirmatory research and sound theory-based, while PLS-SEM doesn't. One of the advantages of PLS is PLS can be used for small sample size research, and it is recommended in marketing-based research Kante et al., (2018).

The structural equation model consists of two models: the inner model and the outer model. The inner structural model discusses the relationship between latent variables, while the outer model measures latent variables Kante et al., (2018). The illustration of the inner model and outer model can be seen in Figure 3.5.

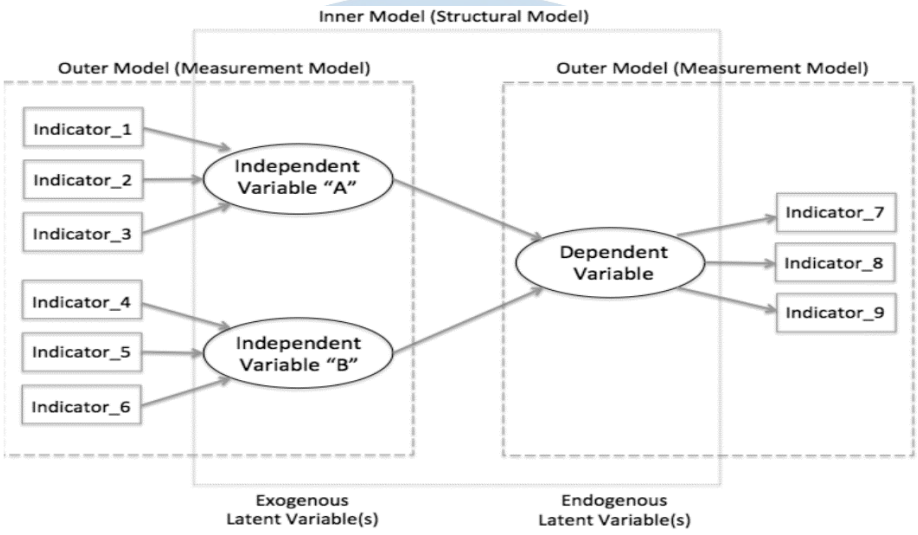

Figure 3.5 Inner Model vs. Outer Model in SEM Diagram
Source: Kante et al., (2018)

3.6.3.1 Measurement Model Analysis (Outer Model Analysis)

According to Kante et al. (2018), measurement model analysis considers the nature of the relationship between construct and measures. Formative and reflective models are two types of measurement models accepted for specifying the relationship between latent construct and observed causally related variables.

The reflective model is identified by the direction of the arrow, which is from the construct to the indicators. It is assessed on their loadings which shows a simple correlation between the indicator and the construct. In contrast, indicators are not reflecting the underlying construct in formative measures, but they are combined without any assumption regarding their intercorrelation. The causality direction moves from the indicators to the construct Kante et al., (2018).

Current research adapts the reflective measurement model, and the summary of assessment on the reflective model can be seen in Table 3.4.

Table 3.4 Summary of Assessment on Measurement Model

Type of Assessment	Criterion	Description
Internal consistency reliability	Composite Reliability > 0.6	The sum of an LV's factor loadings is measured relative to the sum of the factor loadings and error variance. The value lies between 0 (completely unreliable) and 1 (perfectly reliable).

	Cronbach's Alpha > 0.6	Measurement of the degree to which MVs load simultaneously when LV increases.
Convergent validity	Average Variance Extracted (AVE value) > 0.5	Measurement on the degree to which individual items reflecting a construct converge compared to items measuring different constructs.
Discriminant validity	Cross-loadings	The loadings of each indicator on a construct should be higher than the cross-loading on another construct.
	Fornell-Larcker	An LV needs to share more variance with its assigned indicators. The AVE of each LV should be higher than the LV's highest squared correlation with other LV.
	Heterotrait – Menotrait Ration (HTMT) < 1	The ratio between the average correlation indicator across construct is divided by the average correlation of indicators within the same construct.

Source: Kante et al., (2018)

3.6.3.2 Structural Model Analysis (Inner Model Analysis)

After the outer model analysis was done, the next step was to evaluate the inner model to evaluate the hypothesized relationship. Some assessments for a structural model are summarised in Table 3.5, and the proposed research framework plotted using SmartPLS v.3.3.3 can be seen in Figure 3.6.

Table 3.5 Summary of Assessment on Structural Model

Type of Assessment	Criterion	Description
Model Validity	Coefficient of Determination (R^2) > 0.100	R^2 measures the model's predictive power. It is calculated as the squared correlation between a specific endogenous construct's actual and predictive value
	Path Coefficient - Path coefficient standardized value between -1 to + 1. - Critical t-value for two-tailed tests: a. 1.65 (significance level 10%) b. 1.96 (significance level 5%) c. 2.58 (significance level 1%) - P value	Path coefficient measures the hypothesized relationship among the constructs. P-value asses the significance level on the probability of obtaining t value at least as extreme as the one observed actually. It can be said to be the probability of error in rejecting the true null hypothesis.

Type of Assessment	Criterion	Description
	a. < 0.05 (significance level 5%) b. < 0.01 (significance level 1%)	
	Effect Size (f^2)	Measures on the change of R^2 when a specified exogenous construct is omitted from the model can be used to evaluate whether the elimination impacts the endogenous construct.

Source: Kante et al., (2018)

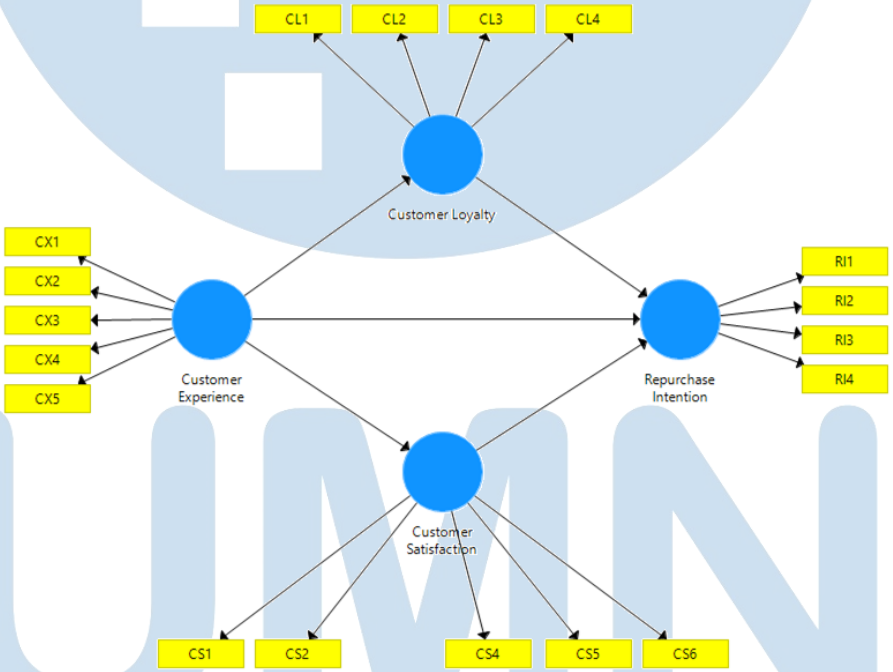

Figure 3.6 Proposed Research Model Plotted with SmartPLS v3.3.3

3.6.3.3 Mediation Effect Analysis

The mediation effect occurs when a third construct intervenes between two other related constructs. The direct effect shows the relationship of two constructs with a single arrow. On the other hand, the indirect effect involves a relationship with at least one intervening construct. The indirect effect is a sequence of two or

more direct effects represented with multiple arrows and characterized as mediating effects. The function of mediation is to explain the existence and relationship between an exogenous and endogenous construct. The mediating effect involves a direct and indirect relationship between the constructs. A relationship between two variables linked with a single arrow is defined as direct effects. On the other hand, the indirect effect occurs when one other variable intervenes or is involved (Hair et al., 2014).

According to Hair et al. (2014), three types of mediation are complementary mediation, competitive mediation, and in-direct only mediation. Complementary mediation has both indirect and direct effect are significant and pointing the same direction. Competitive mediation has both indirect and direct effect are significant but pointing the opposite direction. While indirect-only mediation shows, only the indirect effect is significant. To decide whether the model has full, partial, or no mediation, the analysis can be done through the decision tree in Figure 3.7.

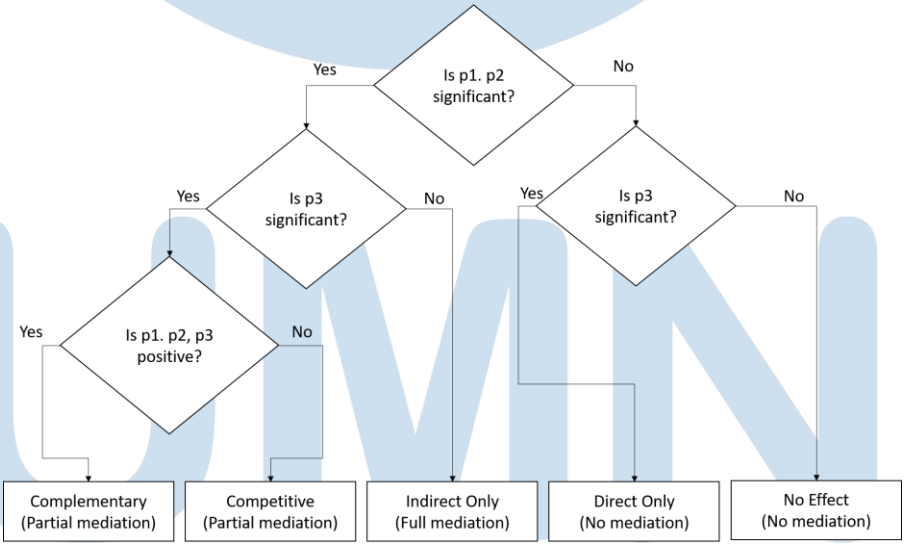

Figure 3.7 Mediation Analysis Procedure
Source: Hair et al., (2014)

3.7 Pre-Test Data Analysis Result

There are 30 data collected for the pre-test, and the data are analyzed using SPSS Statistics Version 22.

3.7.1 Validity Test

The validity test is done to know whether the questions are straightforward and the respondents understand the questions given. The valid result shows that the questionnaire is valid as a measurement tool (Fisla, 2019). Pearson correlation value and Confirmatory Factor Analysis (CFA) are used and based on the theory mentioned previously by Fisla (2019), this study will use both 0.5 as the standard for validity test. The result of the questionnaire validity test can be seen in Table 3.6.

Table 3.6 Pre-test Result on Questionnaire Validity

No	Variable	Pearson Correlation	Loading Factor	Summary
1	CX1	0.803	0.845	Valid
	CX2	0.708	0.761	Valid
	CX3	0.881	0.895	Valid
	CX4	0.689	0.698	Valid
	CX5	0.797	0.708	Valid
2	CL1	0.674	0.672	Valid
	CL2	0.847	0.863	Valid
	CL3	0.901	0.884	Valid
	CL4	0.926	0.932	Valid
3	CS1	0.757	0.777	Valid
	CS2	0.725	0.745	Valid
	CS3	0.718	0.648	Valid
	CS4	0.652	0.666	Valid
	CS5	0.878	0.903	Valid
	CS6	0.878	0.879	Valid
4	RI1	0.947	0.954	Valid
	RI2	0.914	0.929	Valid
	RI3	0.896	0.872	Valid
	RI4	0.904	0.910	Valid

From Table 3.6, both Pearson correlation and loading factor value show a value bigger than 0.5. It means the questionnaire is valid and can be used as a measurement tool for current research.

3.7.2 Reliability Test

Cronbach's Alpha method is used to determine the reliability of a measurement tool. For this research, moderate reliability is enough to determine the consistency of the questionnaire; therefore, the Cronbach's Alpha coefficient bigger than 0.5 is preferred. The result of questionnaire reliability can be seen in Table 3.7.

According to the data in Table 3.7, the Cronbach's Alpha coefficient of all variables is bigger than 0.5. It means that the test is reliable.

Table 3.7 Pre-test Result on Questionnaire Reliability

No	Variable	Cronbach's Alpha	Summary
1	CX	0.853	Reliable
2	CV	0.848	Reliable
3	CL	0.717	Reliable
4	CS	0.799	Reliable
5	RI	0.926	Reliable

In conclusion, the pre-test validity and reliability results are shown in Tables 3.6, and 3.7 which show that the questionnaire is valid and reliable to be used as a measurement tool for this research. Therefore, the questionnaire can continue to be distributed to the remaining respondent for the main test.