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**The moderation effect of environmental awareness on
the relationship between customer's engagement and
value-creation to the company in social media: An
empirical study based on Thai undergraduate student**

By

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**A thesis submitted in partial fulfilment of the requirements for
the degree of
Doctor of Philosophy in Engineering**

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The University of Warwick, Department of WMG
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Table of contents

1 Introduction	1
1.1 Chapter overview	1
1.2 A snapshot of this research project – research problem, aim, questions, and design	1
1.3 Structure of the thesis	7
1.4 Chapter summary	8
2 Literature review	9
2.1 Chapter overview	9
2.2 Social media	10
2.2.1 Definition of social media	10
2.2.2 Types of social media	11
2.2.3 Application of social media on business purpose	15
2.2.4 Social media and supply chain management	16
2.2.5 Characteristics of social media in Thailand	25
2.2.6 Underpinning theories of social media	29
2.2.6.1 Theory of planned behaviour (TPB)	29
2.2.6.2 We-intention	31
2.3 Customer relationship management	32
2.3.1 Customer relationship management through social media	33
2.3.2 Value creation through social media	35
2.4 Environmental awareness and social media	39
2.5 Research gaps and questions	42
2.5.1 Research gaps	42
2.5.2 Overarching research question	44
2.6 Chapter summary	45
3 Theoretical development and hypotheses	46
3.1 Chapter overview	46
3.2 Conceptual framework	47
3.2.1 Customer's engagement in social media based on TPB and We-intention	47
3.2.2 Value creation in social media using COBRA model	50
3.2.3 Attitudinal of environmental awareness and social media	51
3.3 Hypotheses development	53
3.3.1 Social influence, social presence, and trust in social media	53
3.3.2 Trust to engagement and value creation in social media	54
3.3.3 Social influence and engagement in social media	55

3.3.4 Rewards and engagement in social media	56
3.3.5 Engagement and value creation in social media	57
3.3.6 Environmental awareness on engagement and value creation on social media	58
3.4 Chapter summary.....	60
4 Research methodology	62
4.1 Chapter overview	62
4.2 Research philosophy	63
4.2.1 Positivism and Interpretivism	63
4.3 Deductive approach	66
4.4 Quantitative research method.....	67
4.5 Survey research design	70
4.5.1 Constructs development.....	70
4.5.2 Scale development.....	77
4.5.3 Sampling design	78
4.5.4 Survey administration	83
4.6 Data analysis	86
4.6.1 Pilot study	87
4.6.2 Data screening process	88
4.6.3 Exploratory factor analysis (EFA)	96
4.6.4 Confirmatory factor analysis (CFA)	98
4.6.5 Structural equation modelling using AMOS.....	98
4.7 Model fit.....	99
4.7.1 Goodness of fit.....	99
4.7.2 Validity and reliability	101
4.8 Ethical consideration.....	102
4.9 Chapter summary	104
5 Analysis and results	105
5.1 Chapter overview	105
5.2 Pilot study result	106
5.2.1 Demographic profile of pilot study	106
5.2.2 Paired t-test	108
5.3 Data screening	111
5.3.1 Demographic profile of respondents in survey study.....	111
5.3.2 Missing data analysis results.....	115
5.3.3 Multivariate outlier results	117
5.3.4 Normality results.....	118

5.3.5 Linearity results.....	120
5.3.6 Multicollinearity results	121
5.4 Results of constructs testing using Exploratory Factor analysis (EFA).....	122
5.4.1 KMO and Bartlett’s test results.....	122
5.4.2 Communalities results	123
5.4.3 Factor structure results.....	126
5.4.4 Validity and reliability results of the proposed constructs	131
5.5 Results of measurement model assessment using Confirmatory factor analysis (CFA)...	136
5.5.1 Result of model fit index.....	136
5.5.2 Results of reliability and validity of measurement model	138
5.6 Structural model assessment.....	142
5.6.1 Assessment of structural model	142
5.6.2 Cross validation.....	148
5.7 Chapter summary	149
6 Discussion, implication, and conclusions	150
6.1 Chapter overview	150
6.2 Interpret of the findings.....	151
6.2.1 Research question 1.....	153
6.2.2 Research question 2.....	155
6.3 Theoretical contributions.....	159
6.4 Managerial implications.....	160
6.5 Research limitations.....	162
6.6 Future research.....	163
6.7 Chapter summary	164
References	165
Appendix A	179
Appendix B.....	180
Appendix C.....	181
Appendix D	183
Appendix E.....	184
Appendix F.....	188
Appendix G	189
Appendix H	194
Appendix I.....	201
Appendix J	202

List of Figure

Figure 1-1 An overall of the research.....	6
Figure 2-1 A structure of literature review chapter.....	9
Figure 2-2 Mobile internet and social media user in Thailand (Norcross, 2019).....	26
Figure 2-3 Top five most active social media and messenger platforms for Thai internet users (modified from Lee-sanguansuk, 2019; Norcross, 2019).....	27
Figure 2-4 Social media audience profile in Thailand based on age and gender (modified from Lee-sanguansuk, 2019; Norcross, 2019).....	28
Figure 2-5 Theory of planned behaviour (modified from Ajzen, 2012).....	30
Figure 2-6 We-intention model (C. M. K. Cheung et al., 2011).....	31
Figure 2-7 Four steps of CRM (modified from Reimann et al., 2009; Shen et al., 2017; Baumöl et al., 2016)	33
Figure 2-8 Value creation spheres (modified from Grönroos & Voima, 2013).....	36
Figure 3-1 A structure of theoretical development and hypotheses chapter.....	46
Figure 3-2 A conceptual model of this study.....	61
Figure 4-1 A structure of research methodology chapter.....	62
Figure 4-2 Example of deductive principle (modified from (Blumberg et al., 2008).....	67
Figure 4-3 Quantitative research design (adapted from Creswell, 2014).....	68
Figure 4-4 A sample selection procedure of this study.....	82
Figure 4-5 Two-step approach of data analysis (modified from Sreejesh & Mohapatra, 2013).....	87
Figure 4-6 A four-step process of missing data remedies (modified from Hair et al., 2014).....	93
Figure 4-7 Distributions with positive skew or negative skew (top) and with positive kurtosis or negative kurtosis (bottom) relative to a normal curve (Kline, 2011).....	94
Figure 4-8 Basic SEM model (Henseler et al., 2009; Zhang, 2018).....	99
Figure 5-1 A structure of analysis and result chapter.....	105
Figure 5-2 A classification of respondent's information based on gender.....	113
Figure 5-3 A classification of respondent's information based on Year of study.....	113
Figure 5-4 A classification of respondent's information based on University of study..	114
Figure 5-5 A classification of respondent's information based on area of study.....	114

Figure 5-6 Cook's distance by response ID between independent variable onto contribution (dependent variable).....	117
Figure 5-7 Measurement model.....	137
Figure 5-8 Results of structural assessment model from AMOS.....	143
Figure 5-9 The moderation effect between affective environmental awareness on the relationship between SM consumption and SM contribution.....	146
Figure 5-10 The moderation effect between conative environmental awareness on the relationship between SM consumption and SM contribution.....	147
Figure 5-11 The moderation effect between conative environmental awareness on the relationship between SM consumption and SM creation.....	147
Figure 6-1 A structure of discussion, implication, and conclusions chapter.....	150
Figure 6-2 A framework of relationship between environmental awareness and value creation in SM.....	158
Figure 6-3 A refined conceptual framework of the relationship between environmental awareness, customer engagement, and value creation to the company in SM based on empirical data in this study.....	160

List of Table

Table 1-1 Summary of key elements of this thesis.....	5
Table 2-1 Classification of social media on level of interaction and its application to business (adapted from Ngai et al., 2015).....	14
Table 2-2 Summarized the application of social media in supply chain management (modified from Ngai et al., 2015).....	18
Table 2-3 Summary of value creation in social media based on types of interaction and spheres (modified from: Grönroos & Voima, 2013).....	36
Table 2-4 COBRA typology as a continuum of three engagement types; consumption, contribution and creation (Shao, 2009).....	38
Table 2-5 Summary of key findings in literature review chapter.....	45
Table 3-1 Summary of key findings in Theoretical development and hypotheses chapter.....	60
Table 4-1 Comparison of research philosophy (Collis & Hussey, 2014).....	65
Table 4-2 Comparison between data collection method (adapted from Forza, 2016; Miller & Salkind, 2012).....	69
Table 4-3 Measurement items regarding of customer characteristics dimensions.....	73
Table 4-4 Measurement items regarding of environmental awareness dimensions.....	75
Table 4-5 Measurement items regarding to value generation to the company.....	76
Table 4-6 Statistical error (Hair et al., 2014).....	79
Table 4-7 Survey response record.....	84
Table 4-8 Survey error (adapted from Sudman et al., 1993).....	85
Table 4-9 Comparison of imputation techniques for missing data (Hair et al., 2014).....	92
Table 4-10 A summary of data screening methods and criteria in this study.....	95
Table 4-11 Summarise of recommend value of fit index in this study (modified from Hair et al., 2014).....	101
Table 4-12 Summarise of cut-off value for validity and reliability of measurement model (modified from Hair et al., 2014; Gaskin, 2018).....	102
Table 4-13 Summary of key findings in research methodology chapter.....	104
Table 5-1 Demographic background of respondents in pilot study.....	107
Table 5-2 A sample of paired t-test result.....	109

Table 5-3 Demographic background of respondents in survey study.....	112
Table 5-4 Descriptive statistics of missing data.....	116
Table 5-5 Skewness and Kurtosis result.....	119
Table 5-6 Significant value for deviation from IV and DV.....	120
Table 5-7 Variable inflation factor (VIF) for independent variable.....	121
Table 5-8 KMO and Bartlett's results in three model of EFA.....	122
Table 5-9 Communalities results for variables in an initial model of this study.....	124
Table 5-10 Communalities results after deleted 7 items (2nd model).....	125
Table 5-11 initial Pattern matrix of EFA in this study.....	126
Table 5-12 Pattern matrix of EFA after removing Contrib. 4, and 5 in this study.....	128
Table 5-13 Total variance explained.....	129
Table 5-14 Summary of variance explained, factor loading, and communalities of the constructs in this study.....	130
Table 5-15 Factor correlation matrix.....	131
Table 5-16 Comparison of reliability of constructs of initial model and modified model based on Cronbach's Alpha.....	133
Table 5-17 Results of common method bias test using Harman single-factor score.....	135
Table 5-18 Results of model fit indices.....	136
Table 5-19 Reliability of measurement model based on Composite reliability (CR).....	138
Table 5-20 Convergent validity of measurement model based on AVE.....	139
Table 5-21 Standardized correlation.....	140
Table 5-22 Summarise of CR, AVE, and MSV of this study.....	141
Table 5-23 result of invariance test based on gender.....	142
Table 5-24 Results of a structural model assessment based on validation samples (N=458).....	144
Table 5-25 Results of a structural model assessment to assess the cross validation based on calibration samples (N=250).....	148
Table 5-26 Summary of key findings in analysis and results chapter.....	149

Table of Abbreviations

<i>AGFI</i>	<i>Adjusted goodness-of-fit statistic</i>
<i>Amos</i>	Statistical programs of analysis of moment structures
<i>AVE</i>	Average variance extracted
<i>B2B</i>	Business-to-Business
<i>B2C</i>	Business-to-Consumer
<i>CMIN/df</i>	Chi-square/degree of freedom
<i>CU</i>	Chulalongkorn university
<i>CoRM</i>	Community Relationship Management
<i>CFI</i>	Comparative fit index
<i>CR</i>	Composite reliability
<i>CFA</i>	Confirmatory factor analysis
<i>COBRA</i>	Consumer's online brand-related activities
<i>CBBE</i>	Consumer-based brand equity
<i>CEBs</i>	Customer engagement behaviours
<i>CMB</i>	Common method bias
<i>CRM</i>	Customer relationship management
<i>C2C</i>	Customer-to-customer
<i>DV</i>	Dependent variables
<i>E-WOM</i>	Electronic word of mouth
<i>EFA</i>	Exploratory factor analysis
<i>FGC</i>	Firm-generated content
<i>GFI</i>	Goodness-of-fit statistic
<i>HTML</i>	Hyper-text mark-up language
<i>IV</i>	Independent variables
<i>I-intentions</i>	Individual intentions
<i>KMO</i>	Kaiser-Meyer-Olkin
<i>KU</i>	Kasetsart university

<i>MSU</i>	Maharakham university
<i>MU</i>	Mahidol University
<i>MSV</i>	Maximum shared variance
<i>MAR</i>	Missing at random
<i>MCAR</i>	Missing completely at random
<i>OSB</i>	On-going search behaviour
<i>PSU</i>	Prince of Songkla university
<i>PSUIC</i>	Prince of Songkla university international college
<i>PEB</i>	Pro-environmental behavioural
<i>RMUSV</i>	Rajamangala university of technology Srivijaya
<i>RMSEA</i>	Root mean square error of approximation
<i>S-D logic</i>	Service-dominant logic
<i>SEM</i>	Structural equation modelling
<i>SMEs</i>	Small and medium-sized enterprises
<i>SM</i>	Social media
<i>SNSs</i>	Social networking sites
<i>SPSS</i>	Statistical package for the social Sciences
<i>SSRU</i>	Suan Sunandha Rajabhat university
<i>TAM</i>	Technology adoption model
<i>TSU</i>	Thaksin university
<i>TU</i>	Thammasat university
<i>TPB</i>	Theory of Planned-Behaviour
<i>TLI</i>	Tucker-Lewis index
<i>UGC</i>	User-Generated Content
<i>VIF</i>	Variable Inflation Factor
<i>WU</i>	Walailak university

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Chonnawee Pukdeemai

05 July 2020

DECLARATION

This thesis is the original work of the author, submitted to the University of Warwick in support of the application for the degree of Doctor of Philosophy. Also, this thesis has not been submitted in whole or in part as consideration for other degree qualification at this or any other university.

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ABSTRACT

The advent of social media nowadays has changed service consumption, especially for young consumer who is almost always online. The role of the customer in the exchange of value is changing from being a passive actor to be an active participant. There are many ways that companies can benefit and create value from user participation in social media, including (a) through the networking, status updates, and content contribution ; (b) by participating in company development and innovation and (c) by selling information obtained from users' digital data profiles. However, previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape, especially, in the context of Thailand, which most of the study in this area focused on the use of SM on purchase intention or tourism perspective. Besides, environmental concern is a hot issue in both pieces of research and social media platform. Many authors popularly study these, especially in terms of the effect of social media into environmental awareness. Nevertheless, none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company.

The aim of this study, therefore, is to explore the moderation role of environmental awareness on the relationship between customer engagement and value creation in social media in the context of Thai university student. In so doing, a conceptual framework is developed based on existing literature with the Theory of planned behaviour, We-intention, Consumer's online brand-related activities, and attitudinal of environmental awareness. Hence, ten constructs are generated. Following this, two-step quantitative data analysis is carried out. The first is to ensure the accuracy of the questionnaire items and constructs by pilot study and exploratory factor analysis, and the second step is to validate the measurement model and assess the structural model.

This study generated two key findings:

- 1) The findings demonstrate that rewards, customers-brand trust, and social influence have a positive impact on the participation in social media, in which social presence and social influence is found to be antecedence of trust, and trust also has a direct impact on value generation to the company in social media.
- 2) Affective level of environmental awareness strengthens the positive relationship between SM consumption and SM contribution, while the conative level of environmental awareness is found to strengthen the positive relationship between SM consumption and SM contribution and also strengthens the positive relationship between SM consumption and SM creation.

Overall, this study contributes to the advancement of customer-relationship management research by illustrating the performance implication of customer's engagement and value creation in social media, and further advances our understanding of how different attitudinal level of environmental awareness interact with these relationships.

1 Introduction

1. 1 Chapter overview

This chapter provides a high-level introduction to this doctoral thesis. Starting with a snapshot of the project, which briefly introduces the research problem, aim, questions and methodological design in section 1.2. in which a summative table is embedded in this section to highlight the critical elements of the thesis. Followed by the presentation of the structure of the thesis in section 1.3 to recap the whole picture of the thesis to be easier to follow.

1.2 A snapshot of this research project – research problem, aim, questions, and design

Social media originated from the introduction of web 2.0 in 2004 which allowed the generation, communication and exchange of knowledge and information by users in forms of electronic word of mouth (E-WOM), music, pictures, and videos (Khadim et al., 2018; Malik et al., 2016; Roblek et al., 2013; Varkaris & Neuhofer, 2017). The introduction of web2.0 was a transition from more static hyper-text mark-up language (HTML) to a more dynamic web-based which allowed real-time user communication and participation and navigation around the vast amount of information on the web (Hajli, 2013; Malik et al., 2016). It is stated that the number of a social network user is increasing gradually with the higher spending times and frequency on social media platform through a range of both web-based and mobile-based technologies (Adewumi, 2018; Khadim et al., 2018).

The advent of social media nowadays have changed service consumption as a consumer is almost always online and participating in a variety of activities, e.g. creating content, sharing information, experiences, and opinions (Ajina, 2019; Ali et al., 2017; Astuti, 2018; Leys et al., 2019). The role of social media in current business occurred in many literatures (Bocconcelli et al., 2017; Taneja, S., & Toombs, 2014; Bruno Schivinski & Dabrowski, 2014; Adewumi, 2018; Khadim et al., 2018).

In terms of supply chain management contexts, the study of social media has been focused on the customer relationship management (CRM) field. With the development of Web2.0, CRM began a transformation, now named CRM 2.0 or social CRM, from a strategy that was focused on customer transactions to a strategy that incorporated both customer transactions and customer interactions (Baumöl et al., 2016; Greenberg, 2010a; Rodriguez et al., 2015). With the rise of SM, vendors of the Enterprise CRM system began to ask how data from SM can be integrated into an organization's customer database, or technologies such as forums, customer feedback tools, blogs, and community platforms can be integrated to an existing CRM system (Ang, 2011). Social media not only provides an opportunity to connect to their audience conveniently, but it also helps sellers to share and exchange information amongst their customers (Sashi, 2012). This is because, social media can provide novel and useful ways of interacting and collaborating, as well as for creating new knowledge for innovations (Kärkkäinen & Janhonen, 2011).

As a result, engaged customers will become partners to cooperate with vendors in the value-added process to meet their needs. Social media interactions help facilitate the process of creating long-term relationships through a trust and commitment building between sellers and buyers from the creation of emotional bonds for their exchanged relationships (Sashi, 2012). The interactive nature of these digital media not only allows sellers to share and exchange information with their customers but also allows customers to share and exchange information with one another as well. Indeed, the company can create a community using social media tool, for instance, some companies, such as Amazon and TripAdvisor, encourage customers to rate online experiences that everyone can read (Ang, 2011). In other words, customers tend to add value by creating content and even becoming enthusiastic supporters for seller products and can make other people's purchasing decisions in a friend-to-friend interaction (Sashi, 2012).

Even though social media usage is widespread in CRM, yet previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape (Baumöl et al., 2016; Fletcher et al., 2016; Garrido-Moreno et al., 2020; Rodriguez et al., 2015). This is because, a research on mechanisms that control these specific customer engagement behaviours (CEBs) on social media brand platforms is limited (Jayasuriya & Azam, 2017; Suseno et al., 2018). Furthermore, numerous studies have examined various factors affecting the use of online social networking sites (SNS).

However, investigations of these factors are still under development, especially in the context of Thailand, which most of the study in this area focused on the use of SM on purchase intention or tourism perspective. There is a lacks study in the behavioural of SM user in Thailand perspective. In this study, we aim to participate in literature by expanding and testing existing conceptual concepts in new contexts, including how was the SM impact to the customer's value creation in social media with the moderation of environmental awareness.

In CRM, the exploring relationship between customer's behaviour and social media are popularly studied by many authors (Baumöl et al., 2016; Garrido-Moreno et al., 2020; Rodriguez et al., 2015). There are, however, still lacks the work of exploring the relationship between environmental behaviour even there is a current trend of "green thinking" worldwide. Most of the studies on customer environmental behaviour are mainly focus on educational, or product and packaging design (Byrka et al., 2017; Lyon & Montgomery, 2013; Minton et al., 2012).

To address these research gaps, this study aims to explore the moderation role of environmental awareness on the relationship between customer engagement and value creation in social media in the context of Thai university student. The following RQs are supplementary for achieving the research aim (RA).

RQ1: How are the antecedence of customer's behavioural intention (trust, social presence, social influence, and rewards) impact to the engagement and value creation in social media.

RQ2: How do the environmental awareness of customer effect to the relationship between customer engagement and value creation in social media (contribution, creation).

To answer the two RQ, it is necessary to understand the impact of customer's behavioural intention to the engagement and value creation on social media, and the role of environmental awareness to engagement and value creation in SM. In this study, antecedences of customer behavioural intention are developed from the combination of Theory of Planned Behaviour (TPB) and We-intention framework, While the engagement and value creation in social media are developed based on the knowledge of CRM with the application of consumer's online brand-related activities (COBRA) framework, in

which the value can be classified into consumption, contribution, and creation. For the environmental awareness, the author applies the attitudinal of environmental awareness (cognitive, affective, and conative) as a basic knowledge.

The author follows the study of Sreejesh & Mohapatra, (2013) two-step approach of quantitative data analysis was followed because of two main reasons; firstly the two-step approach is suitable for analysis of model that attempt to test new theories (Jituea & Pasunon, 2018). In which for this study, constructs are developed from existing literature from another context of study such as country, ages, etc., Secondly, this research is in the same area of study that is in the customers-brand relationship. The first step of the study comprises of two main sub-steps, including pilot study during the online-survey phase and construct calibration using exploratory factor analysis (EFA). While the second steps, including a measurement model validation using a confirmatory factor analysis (CFA) and structural model validation through statistical programs of analysis of moment structures (AMOS).

In this final paper-based survey, after the data went through screening process in Chapter 5, the number of response data to be analysed is 708 out of 746 returned responses. This data was divided into two groups. The first one was used in the first step of analysis; hence, 250 response were selected randomly by a systematic sampling technique. The reason for selecting this amount of responses are based on (Wolf et al., 2013; Guilford, 1954; Cattell, 1979, MacCallum et al., 1990, and Hair et al. 2014). While, the majority of samples (458 samples) is used for model validation and structural model assessment using CFA and structural equation modelling (SEM), respectively.

The output from data demonstrate that rewards, customers-brand trust, and social influence have a positive impact on the participation in social media, in which social presence and social influence is found to be antecedence of trust, and trust also has a direct impact on value generation to the company in social media. In addition, affective level of environmental awareness is found to strengthen the positive relationship between SM consumption and SM contribution, while the conative level of environmental awareness is found to strengthen the positive relationship between SM consumption and SM contribution, and also strengthens the positive relationship between SM consumption and SM creation. The summarise of key elements covered in this document is shown in Table 1-1 and Figure 1-1

Table 1-1 Summary of key elements of this thesis

Research aim
To explore the moderation role of environmental awareness on the relationship between customer engagement and value creation in social media in the context of Thai university student
Research questions
<p>RQ1: how are the antecedence of customer's behavioural intention impact to the engagement and value creation in social media.</p> <p>RQ2: How do the environmental awareness of customer effect to the relationship between customer engagement and value creation in social media</p>
Research design
<p>Step 1: Constructs and variables calibration</p> <p>1.1 Pilot study</p> <ul style="list-style-type: none"> • Web-based survey (43 responses from Thai undergraduate student in international college in Thailand) • A pair t-test is applied to ensure accuracy in translation of questionnaires <p>1.2 Constructs and variables calibration</p> <ul style="list-style-type: none"> • Paper-based survey (250 responses from total 708 valid responses are withdrawn randomly to use in this stage) • Using exploratory factor analysis (EFA) • Delete 9 variables from total 50 variables (41 remaining with 10 constructs) <p>Step2: measurement model validation and assessment of structural model</p> <p>2.1 Measurement model validation</p> <ul style="list-style-type: none"> • The leftover (458 responses) are used in this step • Examine model fit, convergent validity, discriminant validity, and reliability using confirmatory factor analysis (CFA) <p>2.2 Structural model assessment</p> <ul style="list-style-type: none"> • The results from 458 responses reveal that 12 from 15 hypotheses are accepted based on empirical data • A cross validation based on 250 responses is applied to ensure the validity of model
Final research outputs
A framework of relationship between environmental awareness and value creation in SM (Figure 6-2) and a refined conceptual model (Figure 6-3) is carried out.

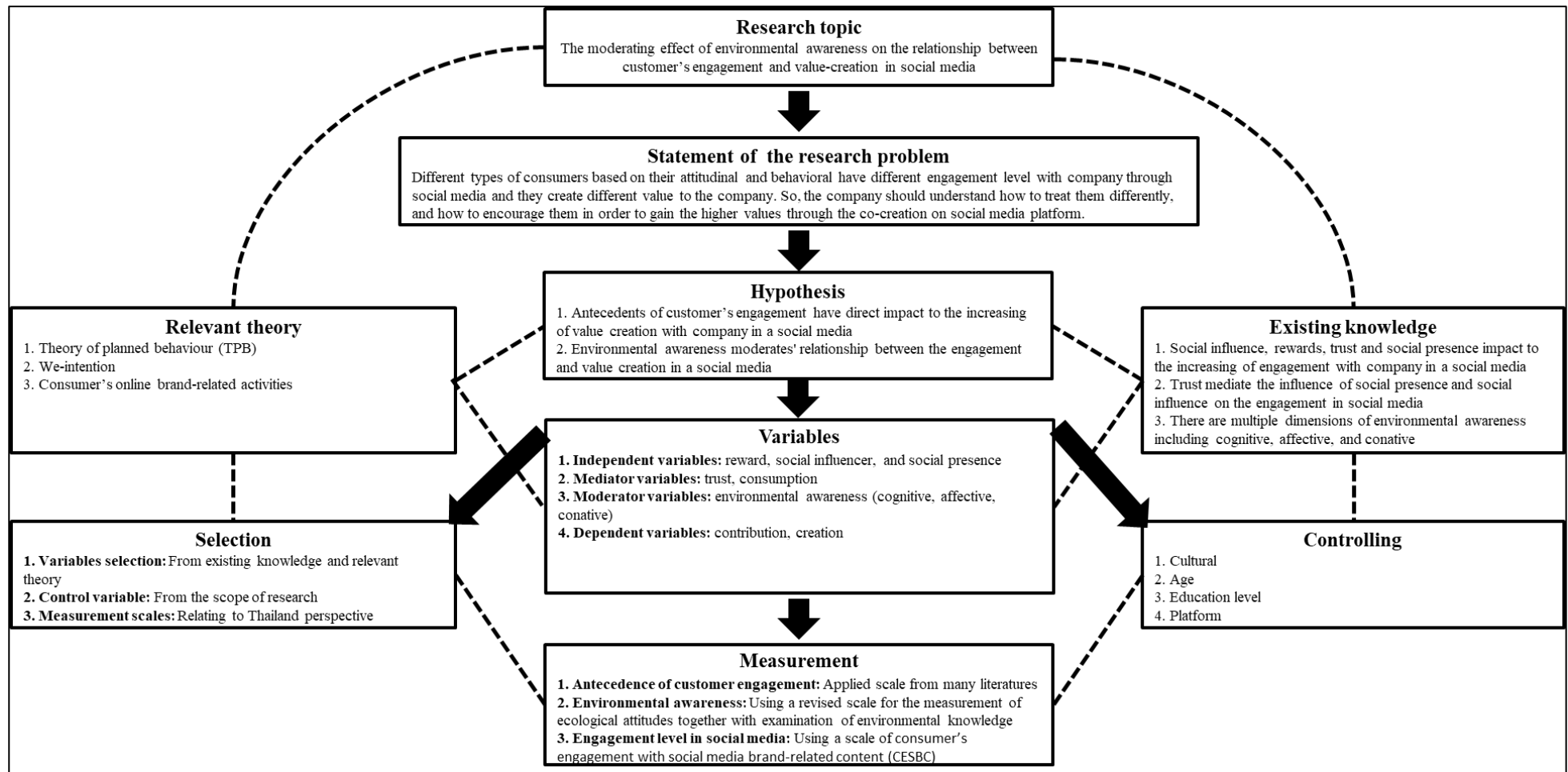


Figure 1-1 An overall of the research

1.3 Structure of the thesis

Following this introductory chapter, Chapter 2 provides a theoretical foundation that underpins this research project. Given that the primary context of this study is the intersection of social media, customer relationship management, and environmental thinking of customers, therefore, Chapter 2 will begin by exploring existing literature and theories related to these specific contexts in section 2.2-2.4 respectively. Research gaps and overarching research question will be presented to fulfil what has not been discovered in existing studies in section 2.5.

Chapter 3 combines the knowledge under the theory of planned behaviour together with We-intention framework, with the attitudinal dimension of environmental awareness to propose a theoretical framework of customer's value creation in social media. This chapter starts with a comprehensive outline of the theoretical framework in Section 3.2. Then, a set of empirically developed hypotheses is presented in section 3.3

Chapter 4 begins with the justification of the author's philosophical stance – positivism in section 4.2, and the chosen research approach – deductive in section 4.3, then moves on to the detailed research design. Given that a quantitative research design is applied in this study in section 4.4, A survey is chosen to be a data collection tools, and the survey design comprise of the constructs and scale development, sampling strategy, and survey administration will be explained in section 4.5. A justification of data analysis in this study is illustrated in section 4.6, while the criteria to confirm accuracy, validity, and reliability of this study will be provided in section 4.7 with an attached of ethical consideration in section 4.8

Chapter 5 presents the results of the survey findings, together with the analysis of the result. The consistency in translation of questionnaires into the Thai language is tested through a pilot study in section 5.2. Data from the survey finding stage will be firstly analysed and screened through the data screening process in section 5.3 to ensure the adequacy of data. After that, the construct in this model is tested using exploratory factor analysis (EFA) to calibrate and revise for the measurement model in section 5.4. In this step, the Statistical Package for the Social Sciences (SPSS) version 26 was employed to test the EFA. The revised constructs in the measurement model will be further calibrated

by confirmatory factor analysis (CFA) in section 5.5 to ensure validity and reliability of this model. A structural model is evaluated by statistical programs of analysis of moment structures (AMOS) version 26, following a standard procedure, and the hypothesis testing results are presented in section 5.6.

Chapter 6 synthesises the findings with reference to the current literature and discusses them regarding to the two research questions in section 6.2. Following this, the theoretical contributions are highlighted in section 6.3, which leads to the discussion of managerial implications in section 6.4. Moreover, research limitations are provided in section 6.5, a few suggestions for future research are discussed in section 6.6

1.4 Chapter summary

This chapter provides a brief introduction to this research project by introducing a snapshot of this research project including the research gap, aim and questions, in which a tabulated table is provided to summarise key elements of this study. Moreover, the detailed structure of this thesis is presented to provide a synopsis of the document.

2 Literature review

2.1 Chapter overview

The purpose of this chapter is to provide a theoretical foundation that underpins this research project. Given that the primary context of this study is the intersection of social media, customer relationship management, and environmental thinking of customers, therefore, this chapter will begin by exploring existing literature and theories related to these specific contexts in section 2.2-2.4 respectively. Research gaps and overarching research question will be presented to fulfil what has not been discovered in existing studies in section 2.5, and the summary of this chapter will be concluded in section 2.6. A structure of this chapter is illustrated in figure 2-1

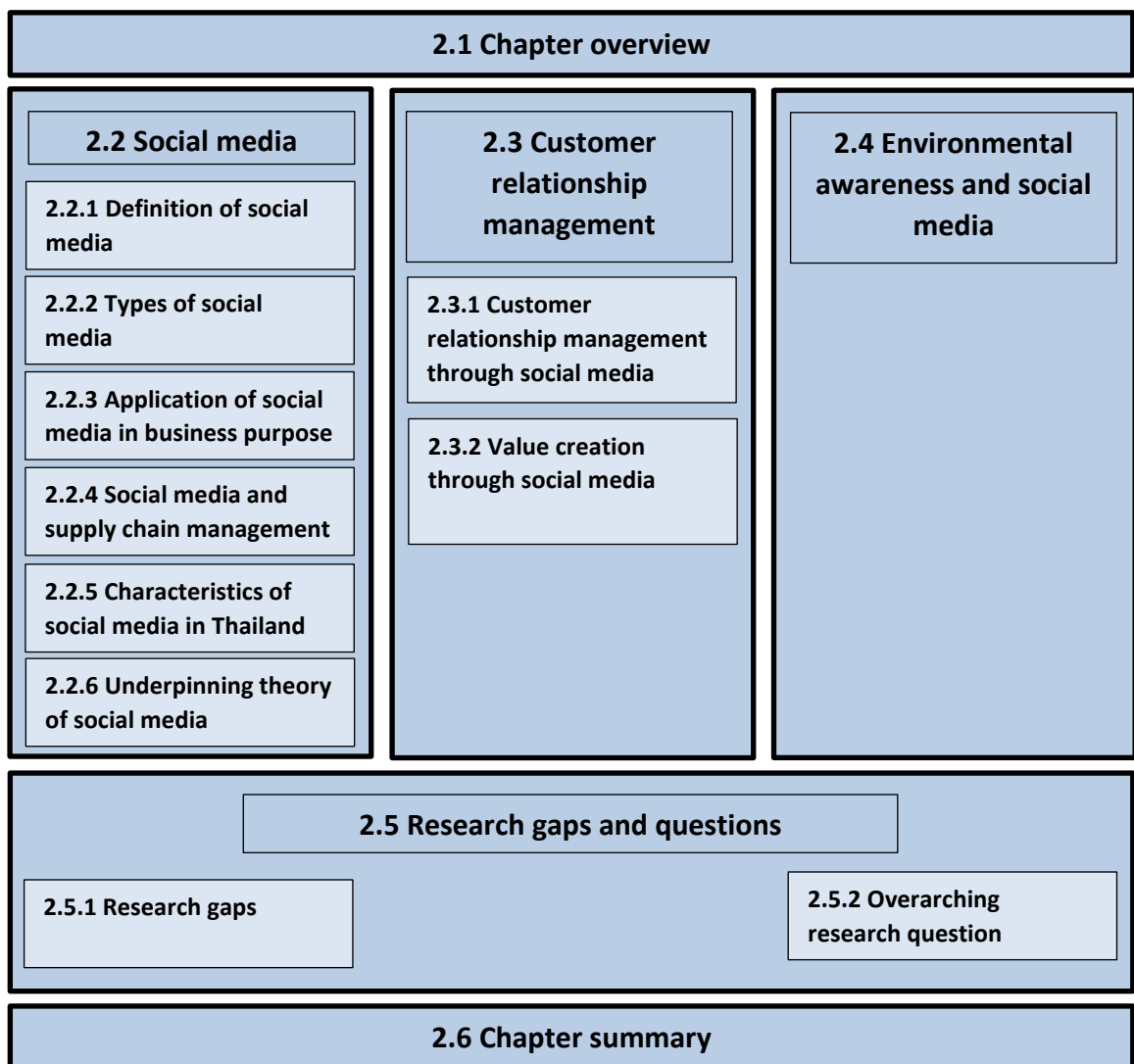


Figure 2-1 A structure of literature review chapter

2.2 Social media

This section will begin with the clarification of social media terminology, followed by the classification of types of social media into six main categories regarding their purpose of use. In addition, the application of social media in business purpose will be explained, and the roles of social media in supply chain management context will also be discussed. Finally, the characteristics of Thai social media will be illustrated, and the underpinning theory of social media will be present in section 2.2.1 – 2.2.6 respectively.

2.2.1 Definition of social media

Social media originated from the introduction of web 2.0 in 2004 which allowed the generation, communication and exchange of knowledge and information by users in forms of electronic word of mouth (E-WOM), music, pictures, and videos (Khadim et al., 2018; Malik et al., 2016; Roblek et al., 2013; Varkaris & Neuhofer, 2017). The introduction of web2.0 was a transition from more static hyper-text mark-up language (HTML) to a more dynamic web-based which allowed real-time user communication and participation and navigation around the vast amount of information on the web (Hajli, 2013; Malik et al., 2016).

Social media terminology is a compound word which comes from the combination of the word “social” which refers to the participation of people towards specific activities and the word “media” that refers to the internet-enabled tools and technologies used to carry out such activities (Lee, 2017; Ngai et al., 2015). This term has been used interchangeably with social networking, social computing, web 2.0, and virtual social worlds (Kaplan & Haenlein, 2009).

Various definitions of social media has been provided by several researchers, for example, Malik et al. (2016) proposed that social media is the thing that someone can use to share their experiences, opinions, and feelings with others. In addition, social media has been highlighted as an internet-connected link to an instant communication channel where people can interact by commenting, sharing, or liking activities (Hajli, 2013; Tomski, 2015). Social media is also defined as an employment of mobile and web-

based technologies to co-create interactive platform (Roblek et al., 2013; Shaheen & Lodhi, 2016). This allows social media to not only be a communication channel amongst users, but it is also defining it as a platform that facilitates various types of business activities such as enabling customer's participation, allowing collaboration with the company, sharing information from a consumer perspectives, or even building a consumer-brand relationship (Astuti, 2018; Zhou & Amin, 2014).

From these various definitions of social media, it can be stated that social media is “a group of Internet-based applications built on the ideological and technological foundations of Web 2.0 that allow the creation and exchange of contents” (Kaplan & Haenlein, 2009). Social media is, hence, a term that encompasses various types of applications through the internet based and gives users quick electronic communication of content.

2.2.2 Types of social media

According to Schivinski & Dabrowski (2014), social media can be divided into firm created and user-generated social media based on the power of the contents controlled. Firm-generated content (FGC) is usually publicity focused and the content is fully controlled by the company while user-generated content (UGC) is independent of the control of companies (Astuti, 2017; Swain & Qing Cao, 2014). It is highlighted that FGC is considered as the dominating social media marketing tool and the receptivity of FGC are measured by such activities as “liking¹”, “commenting²”, or “re-tweeting³” (Wan & Ren, 2009). Whereas, with UGC, customers are allowed to create contents and engage in social interaction online through an online platform, examples are customer reviews on a public available social platform such as Twitter or TripAdvisor (Astuti, 2018; Ramanathan et al., 2017). Schivinski & Dabrowski (2015) studied the impact of FGC and UGC communication on Facebook around brand equity, brand attitude and purchase intention by using, within Poland, a standardized online survey. The result of this research showing that UGC

¹ Liking is to display a positive reaction to a feature that allows users to show their support for specific comments, pictures, wall posts, statuses, or fan pages.

² Commenting is a response that is often provided as an answer or message to a post.

³ Re-tweeting is a process of re-posting of a Tweet which helps you and others quickly share that Tweet with all your followers.

communication had a positive influence on both brand equity and brand attitude, whereas, for the FGC communication affected only brand attitude. This result is not in line with the study of Astuti (2017) carried out in Indonesia, who argued that there is positive relationship between FGC and brand awareness, while there is no significant relationship between UGC and brand awareness, Astuti (2017) also commented that the brand communication created by company management is more effective compared with the use of contents created by Instagram users. This inconsistency between the two studies may come from the difference in the purpose of use between these two social media platform (Facebook and Instagram) and/or the cultural differences between these two studies (Poland and Indonesia) and so these findings require stronger validation and generalization. Hence, a classification of social media based on the purpose of use will be carried out, and the nature of Thai social media users will be further discussed in section 2.2.5

Classification categories of social media regarding the purpose of use distinguished as media sharing sites, blogs and microblogs, social bookmarking sites, social networking sites, social opinion-sharing sites, and virtual worlds (Ismail, 2017; Rodriguez et al., 2015; Shaheen & Lodhi, 2016). These are outlined below.

1. **Media sharing sites** allow individuals to upload and share multi-media objects such as audio, images, and videos, with other users, friends, or with selected communities (Ngai et al., 2015). Examples of popular media sharing sites are YouTube, Flickr, Vimeo, and Instagram (Ismail, 2017; Kapoor et al., 2018; Swain & Qing Cao, 2014). A benefit of using media sharing sites is that they can be used as a significant resource for digital and long-distance learning (Ajina, 2019; Astuti, 2018; Shaheen & Lodhi, 2016; Tomski, 2015; Zhou & Amin, 2014).
2. **A Blog** is type of content where individuals can publish short articles, often called a post, ranging from 500 words to a few pages (Shaheen & Lodhi, 2016). Examples of blogs are google blog (www.blog.google) and Weibo (www.weibo.com), the latter one is widely used in China (Hui Zhao & Jun Liu, 2015; Swain & Qing Cao, 2014). In addition to blog, a **microblog** has basically the same purpose as a blog, , and that is to write information in the hope that someone will read it (Ngai et al., 2015). There is, however, a difference between blog and micro blog in terms of

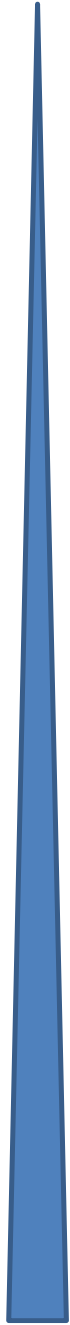
the size of the post (Swain & Qing Cao, 2014). Microblogs sites such as Twitter limits the size of post not to over than 280 words (Ajina, 2019).

3. **Social bookmarking sites** such as Pinterest and Foursquare allow users to categorize, track and trace the content they find interesting. Most social bookmark services are organized by users applying “tags” or keywords to content on a web site (Ngai et al., 2015).
4. **Social opinion-sharing sites** are online communities acting as a discussion forum that allows people to interact in specific areas, for example, discussions about product performance, which can become influential in practice later (Ngai et al., 2015). Examples of social opinion-sharing sites are Yahoo Answers (answers.yahoo.com) and Reddit (www.reddit.com) (Astuti, 2018; Ramanathan et al., 2017).
5. **Social networking sites (SNSs)** are online platforms which people use to develop a community to share ideas, interests and experiences in various formats (Markova & Petkovska-Mirčevska, 2013a; Pratono, 2018; Swain & Qing Cao, 2014). It is suggested that social networking focuses on developing and maintaining relationships among friends and acquaintances (Ngai et al., 2015). One example of social networking site is Facebook which has been highlighted as the most commonly use social media platform (Hansen et al., 2018; Pratono, 2018; Severo et al., 2019). The number of Facebook user around the world can be counted up to 1/3 of all internet users based on the statistics in Statista (<https://www.statista.com/>), and it is further suggested that Facebook has a major influence in the customer’s decision making process amongst others (Ajina, 2019; Carlson et al., 2018).
6. **A virtual world** is an online environment in which users can create avatar to represent their looks and to perform their activities on the platform (Ngai et al., 2015). The appearance of the avatar such as body shape, height, weight, hairstyle, and clothes can be designed and changed as per desire. Examples of virtual world are Second life (www.secondlife.com) and Twinity (www.twinity.com) (Ngai et al., 2015).

Ngai et al. (2015) classified social media types regarding to the level of interaction from weakest level which is media sharing sites to the strongest one which is virtual worlds.

From all above information, it can be summarised types of social media based on purpose of use and its required level of interaction into Table 2-1

Table 2-1 Classification of social media on level of interaction and its application to business (adapted from Ngai et al., 2015).

Level of interaction	Types of social media	Characteristics
 <p>Low</p> <p>High</p>	Media sharing sites	Media sharing types of social media are used to find and share photographs, live video, video, and other kinds of media on the web.
	A Blogs and microblogs,	Blogs and microblogs let individuals share information, ideas, or opinions in a public space through a blog post or post. This communication was traditionally in text form, but can include images, audio, video, and interactive links to other online sites.
	Social bookmarking sites	Social bookmarking is an online service which allows users to add, annotate, edit, and share bookmarks of web documents
	Opinion-sharing sites	Allow individuals share specific and interests through interactive tools on a web site
	Social networking sites	These platforms help to connect with friends, family, and brands. They encourage knowledge-sharing and are all about personal, human-to-human interaction. Users can share thoughts, curate content, upload photos and videos, form groups based on interests, and participate in lively discussions.
	A Virtual world	The virtual world is an electronic environment for computer-based communication that enables new ways of communication, collaboration, and coordination by internet in three dimensional environments by Voice Over Internet Protocol (VOIP). People interact with each other through email, online games, and instant messaging.

From table 2-1, to study the effect of environmental awareness on engagement and value creation in social media, this study will only focus on the most popular social networking site which is Facebook. The reason behind this are:

- As discussed earlier that different types of social media will have their own specific purpose of use which result in the difference in customer engagement types (Astuti, 2017, 2018; Bruno Schivinski & Dabrowski, 2015). Therefore, it is better to focus on one type of social media to interpret the result of study.
- Social networking is a platform that relates to a high level of interaction (Ngai et al., 2015), which conforms with the purpose of this study as it will focus on the level of interaction of customers due to their environmental awareness.
- Social networking has been widely used in different areas of customer-relationship management, for instance, in brand marketing, knowledge sharing, and consumer relation and experience sharing (Ang, 2011; Hajli, 2013).
- In terms of social networking, Facebook is chosen to be representative as it has the highest number of user in Thailand (see section 2.2.5) and it is very famous as a most trust social media platform (Bruno Schivinski & Dabrowski, 2015).

2.2.3 Application of social media on business purpose

The advent of social media nowadays have changed service consumption as a consumer is almost always online and participating in a variety of activities, e.g. creating content, sharing information, experiences, and opinions (Ajina, 2019; Ali et al., 2017; Astuti, 2018; Leys et al., 2019). It is stated that the number of a social network user is increasing gradually with the higher spending times and frequency on social media platform through a range of both web-based and mobile-based technologies (Adewumi, 2018; Khadim et al., 2018). The role of social media in current business occurred in many literatures, Moustakas (2015) shown that customers experience more satisfied and loyal after engaging with an online brand community. Besides, the advent of social media has transformed the way of communication between buyers and sellers, which traditionally it was a one-way communication (Bruno Schivinski & Dabrowski, 2014).

This is to say that, social media initiated the multi-dimensional or two ways, or peer to peer communication between customers and firms. The communication response from

the customer either in the form of electronic words of mouth or reviews are leading to customer's purchase decision and relating to brand image, brand equity, trust, and consumer perception towards firms benefit of social media is that it can be used as a cheap marketing tool for a small and medium business. This significance of using social media in SMEs is not only enabled SME to reach their customer but also partnering with other businesses to collectively enhance their profiles in particular geographic area or community to overcome their structural scarcity of resources by exploiting and mobilizing competences outside boundaries of their small organization (Bocconcelli et al., 2017; Taneja, S., & Toombs, 2014).

To sum up, social media can be used for information sharing, relationship building, improving communication, enhancing coordination and increase company performance (Markova & Petkovska-Mirčevska, 2013a; Swain & Qing Cao, 2014).

There are, however, some disadvantages of using social media in business purpose. For example, it can be misused to promote unhealthy products such as nutrient-poor food and beverages, alcohol, and tobacco on social media sites (Dunlop et al., 2016). Also, it has a lack of external control over media content, issues about the credibility of the information, potential for information overload, and the sensationalism and amplification of risk (Henderson et al., 2017). Therefore, the company need to balance between merits and its drawbacks to successfully adopted social media in their business strategies.

2.2.4 Social media and supply chain management

Social media terminology is very new in research areas due to this technology is just happened after the occurred of Web2.0 in 2004. Web 2.0, also known as social media, is the use of the World Wide Web to increase creativity, data sharing, and collaboration between users. Social media is driving much thinking about business principles. The study of social media within supply chain management is, however, lagging behind other business functions, even if it is developed into supply chain management 2.0 (Bunvorn, 2017; Kunthorn et al., 2018; Markova & Petkovska-Mirčevska, 2013).

This study, therefore, is aiming to fill the gap by starting with the classification of research themes in social media and supply chain management. In this intersection area, the author developed key classification schemes from existing scholars which have conducted a critical literature review of social media research and classified it through a set of criteria. Kapoor et al. (2018) collected 132 papers regarding social media in selected IS Journal and they analysed the critical theme of studies into 13 main themes such as the social media usage behaviours, risks and concerns of using social media, and social media for marketing purposes. In addition to Kapoor, Nicolas Alarcón et al. (2018) focused their classification themes of research into a business purpose by investigated and grouped the social media literature on its relation to business perspectives throughout 2014-2015.

Furthermore, Ngai et al. (2015) conducted and critiqued a review of literature of social media research with a purpose to develop a conceptual framework that explains how social media applications are supported by a variety of social media tools and technologies. Results from these studies demonstrated that social media have been applied in diverse business areas with the support of various social media tools and technologies and underpinned by a range of personal and social behaviour theories and models. In this research, classification themes will only focus on the use of social media in supply chain management based on the modification of classification schemes in existing literature (Kapoor et al., 2018; Ngai et al., 2015; Nicolas Alarcón et al., 2018) in order to find out a gap in the existing literature.

In terms of social media and supply chain management, many studies try to classify the use of social media (Kapoor et al., 2018; Lee, 2017; Ngai et al., 2015; Nicolas Alarcón et al., 2018). Table 2-2 summarises the articles regarding the application of social media in the domain of marketing, communication, enterprise collaboration, electronic commerce, and supplier management.

Table 2-2 Summarized the application of social media in supply chain management (modified from Ngai et al., 2015).

Domain	Sub-areas	Articles
Customer relationship management (CRM)	<ul style="list-style-type: none"> - Marketing strategy - Consumer behavior - Consumer trust - Branding - Customer experiences - Online customers relation 	<p>Taneja, S., & Toombs (2014), Bocconcelli et al. (2017), Wan & Ren (2009), Minton et al. (2012), Ramanathan et al. (2017)</p> <p>Moustakas (2015), Malik et al. (2016), Song & Yoo, (2016), Singla & Arora (2012), Dunlop et al. (2016), Shaheen & Lodhi (2016)</p> <p>Hajli (2013), Khadim et al. (2018), Astuti (2018)</p> <p>Schivinski & Dabrowski (2014), Schivinski & Dabrowski (2015), Hutter et al. (2013), Astuti (2017), Ismail (2017)</p> <p>Ramanathan et al. (2017), Hui Zhao & Jun Liu (2015), Kang & Kim (2017)</p> <p>Rosman & Stuhura (2013), Rodriguez et al. (2015)</p>
Communication	<ul style="list-style-type: none"> - Public communication - Within their supplier 	<p>Zhou & Amin (2014), Ma et al. (2011), Henderson et al. (2017), Ali et al. (2017)</p> <p>Lyon & Montgomery (2013), Birim (2016), Kampf (2014)</p>
Enterprise collaboration	<ul style="list-style-type: none"> - Business to business (B2B) - Knowledge sharing 	<p>Schultz et al. (2012), Fletcher et al. (2016), Feltus & Proper (2018)</p> <p>Roblek et al. (2013), Tomski (2015), Nguyen et al. (2015), Weiss & Jalilian (2015)</p>
Electronic commerce	Online market platform	Adewumi (2018), Makki & Chang (2015), Calefato et al. (2015), Bunvorn (2017)
Supplier management	<ul style="list-style-type: none"> - Supplier risk management - Supplier performance - Product development 	<p>Safari et al. (2015), Kang & Kim (2017), Fu et al. (2013)</p> <p>Choi (2018), Fu et al. (2013), Wu et al. (2017), Pratono (2018), Swain & Qing Cao (2014)</p> <p>Cheng et al. (2018) Ketonen-Oksi et al. (2016), Piller et al. (2012)</p>

Social media (SM) is considered as a new marketing strategy which receives a growing intention from academia (Carlson et al., 2018; Giampietri et al., 2018; Jayasuriya & Azam, 2017). In addition, SM has changed marketing by shifting the scalability of influence and the ways in which consumers share, evaluate and choose information through the use of social media such as blogs, online forums and social networks (Taneja, S., & Toombs, 2014). The application of SM on marketing strategy can be founded as research of Taneja, S., & Toombs (2014) which explored benefits and limitations of SM in small business marketing strategies compared to traditional tools and they found benefits of social network in supply chain strategy in terms of visibility, capability, sustainability, differentiation, while, the limitations of social media was the lack of knowledge, lack of security, lack of engagement, duplication of idea and practice, and also reputation. This is supported that social media is accounted as a new strategic marketing tool in small and medium-sized enterprises (SMEs) according to the research regarding social media as a resource in SMEs' sales process which aims to explore the impact of SM adoption in upgrading and innovating selling processes by SMEs facing complex and rapidly changing market scenarios and the results confirm that social media is a strategic resource to implement an effective business networking effort (Bocconcelli et al., 2017). This is, however, for low-involvement products, persuasive and promotional contents are more attractive to consumers and effective in generating sales (Wan and Ren, 2009). Ramanathan et al. (2017) observed the importance of social media with the interaction to marketing strategy in the large network of convenience stores and found that SM is enabling retail networks to build loyalty and value-based models. To conclusion, regardless of the size of the company (small, medium, large), SM can be used as marketing strategies to increase value to the company (Bocconcelli et al., 2017; Ramanathan et al., 2017; Taneja, S., & Toombs, 2014).

The use of SM on customer behaviour has received much attention from researchers, for example, Malik et al. (2016) observed the importance of SM on consumers' purchasing behaviours and they found that there is a significant impact of information acquisition, electronic word of mouth, customers' perceived quality and seller created information on consumers' purchase intention while customers' perceived risk has a negligible impact on purchase intention. Additionally, the research of Song & Yoo (2016) examined whether SM may impact a customer's purchasing decision during the pre-purchase stage of service

consumption which has been found that SM does have a positive relationship with customers purchase decision. This is in line with another study proving that customers are not only become more satisfied and loyal but also experience relationship benefits after engaging with the online brand community while interacting with the company through SM (Moustakas, 2015). SM can be misuse, for example, use as a tool to create a cyberbullying, as a study shown of adolescents in Belgium reported a strong positive relationship between adolescents' attitude towards cyberbullying and their behavioural intention to perpetrate it. (Heirman & Walrave, 2012). To conclude, SM can be used as a tool to shape customer's behaviour in both good and bad ways; hence, users must be careful when using SM as it can create benefits and harm at the same time (Heirman & Walrave, 2012; Malik et al., 2016; Moustakas, 2015; Song & Yoo, 2016).

The impact of SM on consumer trust is studied by Hajli (2013), who investigated the role of trust in SM platform of the company on purchase intention using Facebook, Twitter, and LinkedIn within UK consumers. The results showed that trust on social media has a significant direct effect on purchase intention. This is compatible with the research in another country (Indonesia) and another platform (Instagram) that identify a significant positive effect on consumer trust in doing online shopping; and that consumer trust has a significant, positive effect on purchase intensity and perceived usefulness (Astuti, 2018). Hence, it can conclude that trust is one of the effect of the key factors to the intention in participating to the company in SM, regardless of your cultural difference and nature of SM platform (Astuti, 2018; Hajli, 2013).

Branding through SM has been studied by Schivinski & Dabrowski (2015) to observe the impact of firm-created and user-generated social media communication on brand equity, brand attitude and purchase intention and the results showing that user-generated social media communication had a positive influence on both brand equity and brand attitude, and also brand equity and brand attitude have a positive influence on purchase intention. Another study has been carried out to define, and analyses the influence of social media brand communication on the consumer-based brand equity (CBBE), with the results confirm a significant positive relationship between firm-created social media brand communication and brand awareness/brand association via Instagram (Astuti, 2017). In this study, he explored that user-generated communication has no significant effect on the CBBE model. These differences between the study of Schivinski & Dabrowski (2015)

and Astuti (2017) are based on the nature of platform as the first one has been carried out for a Facebook user, while the latter one has been scoped to Instagram. This is to support that in order to analyse data precisely, and the author must specify what does it means by “social media” as in this study, the author will focus on one of the social networking platform called Facebook.

In the field of the customer experience through SM, it has been studied by many scholars, for example, Ramanathan et al. (2017) have analysed the interaction and relationship of a brand, promotional offers, service operations through social media reviews on customer satisfaction level amongst UK consumer. Results of their study reveal that SM reviews were dramatically impacted on customer satisfaction. While, Hui Zhao & Jun Liu (2015) focused their study on China perspective in order to study how social media can enable and facilitate in customer’s experiences and collective memories on a most popular Chinese SM platform, namely Weibo. This study shows that Weibo can offers individuals with an optional community to share, suppress, and frame collective memories which interrelate to the changing socio-political context in China. Furthermore, A. X. L. Shen et al. (2009) studied the effect of social influence in SM through the use of instant messaging on user-experiences and found that SM mediated the usage experience in SM. Regardless of the platform and cultural differences, it can be concluded that the experience of customers in the online platform is related to the customer’s perception and value to the company (Hui Zhao & Jun Liu, 2015; Ramanathan et al., 2017; A. X. L. Shen et al., 2009).

Rosman & Stuhura (2013) explored the implications of social media on customer relationship (CRM) in the travel industry, and they encountered that customer reviews seem to provide hotel management with valuable market information, which can provide an opportunity to understand the trends as well as a benchmark a hotel against the industry by extending the knowledge of CRM by focusing on value-creation in the context of the museum as an example of a cultural organization which is an essential part of information management. The results showed the role of social media platform as a system resource collector which provide a technology platform that exposes modular resources to facilitate the formation of higher relationship management and create value to the producer (Singaraju et al., 2016). Previous research has shown that the creation of CRM in social media is essential factors in determining the acceptance and use of various

information technology. However, these factors are not sufficient to explain users' ongoing intentions in the value-creation perspective, especially in environmental awareness on the relationship between antecedence of customer's intention and the value creation in social media. Hence, it is required to bridge this gap of existing knowledge in order to understand how antecedence of customer's intention and environmental awareness impact to the value creation in social media.

The application of SM on organisation communication can be divided into communication between businesses and communication to the public. For the previous one, Lyon & Montgomery (2013) explored how the use of SM by external stakeholders will affect corporate greenwash behaviours. They recommended that the advent of social media is likely to diminish corporate greenwash. Another study regarding the application of SM between business has been proposed by Birim (2016) who constructed a model to investigate and assert how social responsibility and social media might become essential elements in terms of business' communication strategies. He is planning to propose and test the empirical model via structural equation modelling. Also, Kampf (2014) analysed the role of social media for the communication to customers lifelong learning by analysing 2 cases of businesses, and he found that the cultural production of new consumer practices of knowledge about products is supported by social and mobile technology.

In terms of communication with public, Henderson et al. (2017) identified the role of social media in communication about food risks by journalist, regulators, and food industry, and the authors argued that journalists and food industry use social media to identify and produce news, while food regulators need to maintain a social media presence to ensure that accurate food safety information is available and spread throughout social media for public use. Zhou & Amin (2014) proposed a conceptual framework to identify the preceding in time or order that affect members' online community commitment in the context of China as it has been expected that the online communities can bring new benefits and challenges to the business. Furthermore, Ma et al. (2011) have been analysed the role of government and media in food safety emergencies. The authors found that governments and media should have functional interactions in dealing with food safety emergency reports. While, Ali et al (2017) focused their research on the effect of using SM communication through celebrities in the context of the United Arab Emirates., they revealed that celebrities in society play an important

role in communication with consumers especially for those who are the millennial audiences. This is to note for this study that consumer's age is affected by the engagement in social media, especially for those who are young, which is more easily attracted by a social influencer.

The application of social media on enterprise collaboration has been divided into collaboration amongst businesses and the use of social media in creating knowledge sharing. The research regarding enterprise collaboration between businesses have been done in many works of literature, for instance, Schultz et al. (2012) proposed and empirically assessed a model of social media usage among business-to-business (B2B) salespeople. The results shown that social media users have positively affects sales performance. Moreover, Fletcher et al. (2016) analysed that independent social and commercial activities are developed in response to the decline of UK High Street and to respond to the challenges of increasing digital retail opportunities. They found out that the social supply chain has the potential to create a more efficient retail model for the high street and future cities.

Roblek et al. (2013) proposed a conceptual framework to investigate the significance for organizational development and adaptation to an ever-changing business environment based on the concepts of innovative economy, knowledge management and social media for value creation. From the business-to-business (B2B) knowledge sharing of Roblek et al., Nguyen et al. (2015) examined the relationships between knowledge obtained from social media and market orientation, social media strategic capability, and brand innovation strategy on the business-to-consumer (B2C) perspective. They mentioned that social media strategic capability positively affects brand innovation and act as a moderator between knowledge acquisition, market orientation, and brand innovation. Moreover, Tomski (2015) expanded the study of Nguyen et al. from local B2C to global B2C perspective by study the influence of the utilization of SM by the entrepreneur at the stage of the process of firm internationalization. The author reveals that there is a significant impact of possessing a group of friends in the profile on social networking sites which constitute the source of information concerning foreign affairs. As a result, SM can be used as a knowledge-sharing tool for B2B, B2C, and also to global business (Nguyen et al., 2015; Roblek et al., 2013; Tomski, 2015).

The application of social media as electronic commerce is in favour amongst researchers, for instance, Calefato et al. (2015) highlighted that social media have a better potential to communicate beneficence and generousness towards customers cognitive trust compare to a traditional website. This study has been further analysed the difference level of E-commerce usage in terms of the platform by Makki & Chang (2015) who explored the divergence between the effects of social media on a computer and mobile usage on E-Commerce in Saudi Arabia and they discovered that Saudi consumers prefer to shop online using mobile devices. In addition to the differences in platform, Adewumi (2018) concentrated on clarifying the relationship between how easy to use social media and its impacts on profits, and his result indicated that the more comfortable to use of social media is, the more profits company will gain. In conclusion, social media can be used as an effective platform for e-commerce (Adewumi, 2018; Calefato et al., 2015; Makki & Chang, 2015).

Fu et al. (2013) provided a framework that will help in hiring social media to support supply chain risk management. Also, literature regarding supply chain performance and product development area are studied by Pratono (2018) who developed a structural equation model to explain the complicated relationship between a social network and firm performance and the results showing that trust in the social network leads to a positive impact on firm performance. While, the latter one is considered by Cheng et al. (2018) who assumed that social media use enhances the effect of supplier involvement on new product development (NPD) performance, and found that social media is not just used to strengthen the positive effect of new product performance. However, it is also alleviating the harmful effects of vendor involvement in product innovation.

In conclusion, although social media usage is widespread, yet previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape. Application of social media has been widely studied in supply chain management contexts, especially on customer relationship management (CRM) field. In CRM, the exploring relationship between customer's behaviour and social media are popularly studied by many authors (Baumöl et al., 2016; Garrido-Moreno et al., 2020; Rodriguez et al., 2015). There are, however, still lacks the work of exploring the relationship between environmental behaviour even there is a current trend of "green thinking" worldwide. Most of the studies on customer environmental behaviour are

mainly focus on educational, or product and packaging design (Byrka et al., 2017; Lyon & Montgomery, 2013; Minton et al., 2012).

Furthermore, numerous studies have examined various factors affecting the use of online social networking sites (SNS). However, investigations of these factors are still under development, especially in the context of Thailand, which most of the study in this area focused on the use of SM on purchase intention or tourism perspective. There is a lacks study in the behavioural of SM user in Thailand perspective. In this study, we aim to participate in literature by expanding and testing existing conceptual concepts in new contexts, including how was the SM impact to the customer's value creation in social media with the moderation of environmental awareness.

To fulfil this gap in existing research, it will start by clarifying the underpinning theories behind consumer's behaviour on social media in section 2.2.6, and identifying the knowledge of CRM and online-value creation together with exploring the info of environmental awareness in section 2.3 and 2.4 respectively.

2.2.5 Characteristics of social media in Thailand

The total number of internet users and social media user is approximately 57 million and 51 million users respectively, which accounted to 82 percent for internet users, and 74 percent for social media users out of 69.24 million population in Thailand (Lee-sanguansuk, 2019). These number of social media user are increased gradually around 5 percent within 9 months (April 2019 and January 2020) (Norcross, 2019). This is mainly because of the advent of smartphones which affected an increasing number of social media user. The number of mobile subscriptions is around 92.33 million, which accounted for 133 percent of the population. From these mobile registered devices, 49 million of mobile owner used social media on a mobile platform (Norcross, 2019). These stats are illustrated in Figure 2-2.

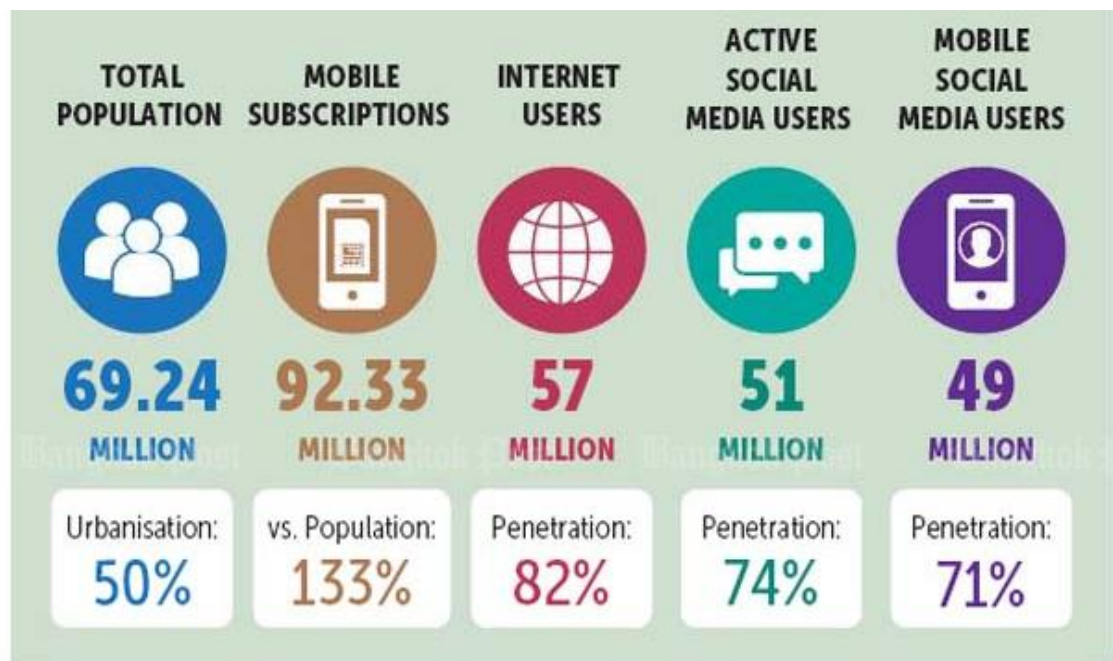


Figure 2-2 Mobile internet and social media user in Thailand (Norcross, 2019).

Extended from figure 2-2, the global survey based on users aged 16-64 during the second and third quarters of 2019 showing that within 51 million users of social media in Thailand, the top five most active social media and messenger platforms for internet users are Facebook (93%), YouTube (91%), Line (84%), Facebook Messenger (72%) and Instagram (65%) (Lee-sanguansuk, 2019). This is shown in Figure 2-3. Not only the number of active users on Facebook is ranked 1, but the monthly traffic of Thai social media user on Facebook is also ranked 1 with the number of country's average daily time spent on the internet via any device is 9.11 hours (Norcross, 2019).

The study also revealed that the average user clicks 'like' to the Facebook pages of company are seven times, six comments, and shares two posts each month. This is accounted for approximately 4 percent of total engagement on their following pages, and the study also indicated that Thai female tends to have more engagement to the company on social media than Thai men (Norcross, 2019). From all these data, it will help to scope the focus of this study into Facebook, which has the most significant attention amongst Thai people. Besides, the invariance on the effect of gender on the result will be discussed in the analysis chapter 5 in order to explore whether there are any differences between the results of these two groups or not.

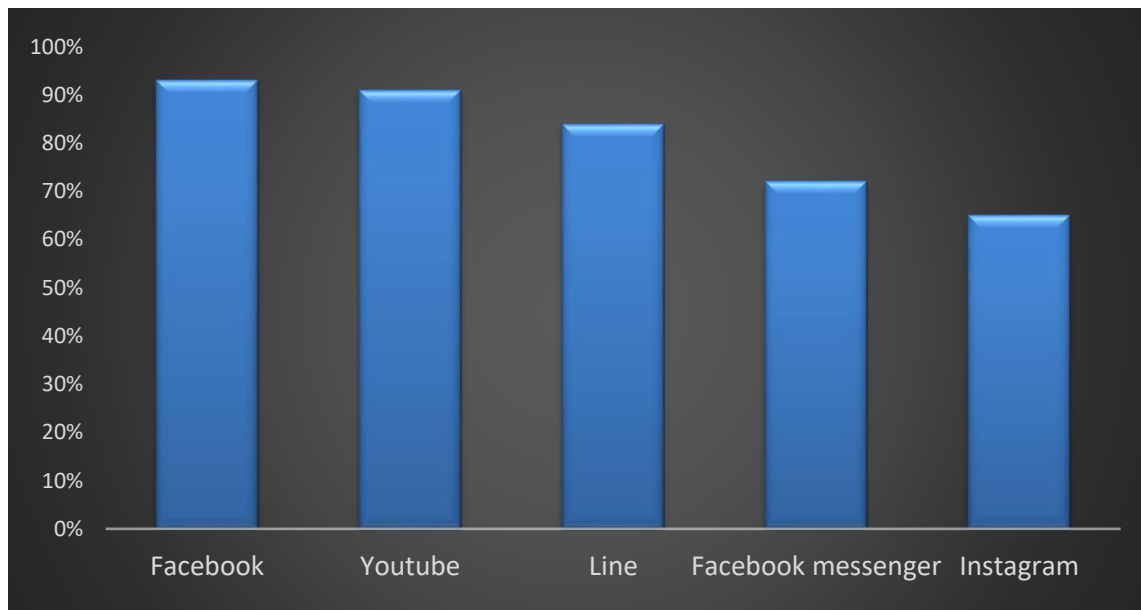


Figure 2-3 Top five most active social media and messenger platforms for Thai internet users (modified from Lee-sanguansuk, 2019; Norcross, 2019).

Thailand is home to one of the youngest online markets in the world, with younger internet users representing a higher proportion of the web population and more involved in spending time online (Kamnoetsin, 2014; Thumsamisorn & Rittippant, 2011). Social media audience profile of Thailand will be illustrated in Figure 2-4, in which the highest number of social media user are in the newly graduated and followed by college student. This is in line with many countries that those who are younger tends to spend more time on social media (Astuti, 2017; Dunlop et al., 2016; Kang & Kim, 2017) . Moreover, Pelling, E. L., & White (2009) suggested that young people who have a good attitude towards using high level of SNSs and those who feel pressured by others to use these high levels are more likely to intend to participate in higher level SNSs. This is supported by the result of study of Cameron (2010) that a university college have a high intention to use SNSs.

This study, therefore, will followed the existing study by focusing the research to the college university students as they are in the top users of social media, and their engagement to the social media is also high compared to others (Norcross, 2019).

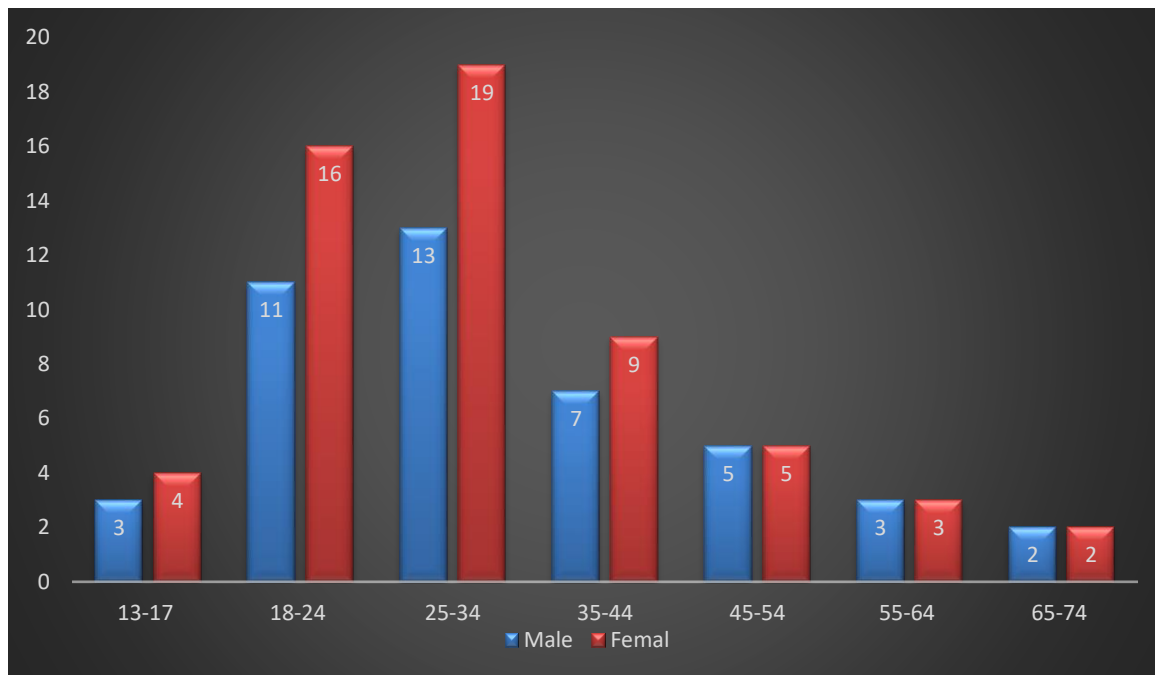


Figure 2-4 Social media audience profile in Thailand based on age and gender (modified from Lee-sanguansuk, 2019; Norcross, 2019).

From figure 2-4, the horizontal axis is the age range, while the vertical axis is the percentage of users. This figure illustrated that the highest number of social media user is in the early working age (25-34 years old) as the stat showing that most of social media users are in this range, followed by those who are teenagers (18-24 years old), which are accounted approximately 32% and 27% respectively.

From all above information regarding characteristics of social media consumption in Thailand, it can guide the direction of this study to focus the relationship of environmental awareness on social media and its value creation to the company by focusing on a Thai colleague student within social networking platform called Facebook. Details of the population of this study and sampling recruitment procedure will be further explained in the methodology chapter.

2.2.6 Underpinning theories of social media

Many studies developed their work based on existing theory and model in order to explain any incidences. In terms of the research on social media, researchers are developed their hypothesis regarding the existing social behaviour model. Some researchers also combined the knowledge in each model and proposed their theoretical model to be analysed later. While many theories and models are proposed in examined any behaviour in social media, this study will follow the work of Ajzen (2012) who proposed the theory of planned behaviour (TPB), combining with We-intention. This is because TPB is widely used in social media and customer relationship management literature. It covers behavioural, normative, and control beliefs to explain the intention and behavioural in social media. At the same time, We-intention will be used to explain person's view themselves as part of social representation in performing a group act in social media because the engagement in social media does not come from individual's preference. However, it also comes from our society influence as we are a part of society. (Oreg & Katz-Gerro, 2006; Pelling, E. L., & White, 2009; Thorbjørnsen et al., 2007; Zoonen et al., 2014). Details of these theories will be explained in section 2.2.6.1 and 2.2.6.2, respectively.

2.2.6.1 Theory of planned behaviour (TPB)

Theory of planned behaviour (TPB) is developed in 1985 to overcome limitations of the theory of reasoned action (TRA), which is presented by Ajzen and Fishbein in 1975, by adding perceived behaviour control to moderate the effects of attitudes and subjective norms on volitional behaviour (Ajzen, 2012; Ajzen & Icek Ajzen, 2006; Madden et al., 1992; Ngai et al., 2015). According to the theory of planned behaviour (PPB), human behaviour is guided by three kinds of considerations: beliefs about behaviour (behavioural belief), beliefs about normative expectation (normative belief), and beliefs regarding the factors which can encourage or discourage the performance of behaviour (control belief). Model of TPB is presented in Figure 2-5.

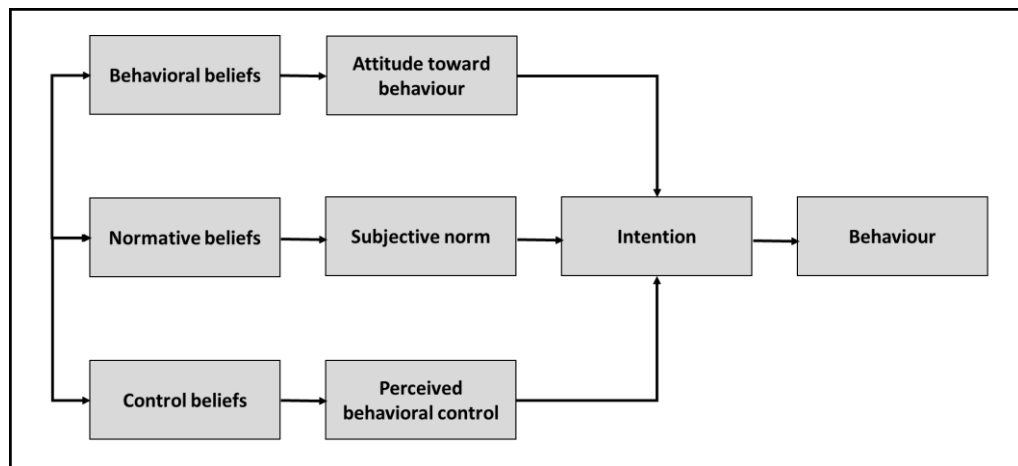


Figure 2-5 Theory of planned behaviour (modified from Ajzen, 2012).

From figure 2-5, in terms of beliefs about behaviour, this theory founded that if a person believes that any behaviour that has a positive effect will tend to have a positive attitude towards that behaviour, while, if individuals believe that conducting that behaviour will have a negative effect, it will tend to have a bad attitude towards that behaviour. These attitude towards behaviour will result in an intention to show that behaviour. For subjective norm, if an individual receives that people who are important to them have done that behaviour or want them to do that behaviour, they will tend to conform and follow. In control beliefs, it is highlighted that the higher resources and opportunities that individuals can occupy will affect to their perceived behavioural control over the behaviour (Ajzen, 2012; Ajzen & Icek Ajzen, 2006; De Groot & Steg, 2007).

From the TPB, the engagement with the company in social media behaviour has relied on three factors. Firstly, individuals need to have a right attitude towards the participation in social media platform as it can bring benefits for both themselves and the organization when they have an excellent attitude to share and exchange knowledge in social media, it will lead to the intention to exchange and share knowledge with others. The second factor is that personnel think that people who are important to them, such as friends and family are participating to the company on social media, they will likely to share and exchange this knowledge in social media as well. The final factor is recognition of the ability to control behaviour as the more able individuals have, the higher intention of participating in social media.

The underlying knowledge of TPB in the social media dimension will be further discussed in Chapter 3 to develop a conceptual framework and hypotheses of this study.

2.2.6.2 We-intention

With the advent of Web 2.0, the business world is changing how to communicate and collaborate quickly. The engagement in social media does not come from an individual's preference, yet it also comes from society intention as we are a part of society. We-Intention or collective intentionality means the individual's commitment to participate in joint operations and involve implicit or explicit agreements between participants to participate in the joint operations (Tuomela, 2003). It has been pressed in terms of "we together will perform X (X means joint action), while I-intention is instead to explain with individual level for personal actions (BAGOZZI, 2000). We-Intention will explain when an individual looks at themselves as part of being a social representative in group performances. In general, the mutual acceptance of some members of a group involves the integration of members to hold relevant social attitudes ("We Attitudes"), that is to say, whether they are a family member or belong to a family concept. In the case of standards, overall acceptance must be in "We mode" which is acting as a group member and related to the meaning for the group (Cheung et al., 2011). Participants must work together to resolve what they accept. Social institutions are used as social guidelines under the norms to introduce new social status and concrete convictions regarding certain practices or elements related to those practices (Tuomela, 2003). Intention to collectively participate in social media is based on three factors, including social influence, users and gratifications, and social presence (C. M. K. Cheung et al., 2011). Model of We-intention is presented in Figure 2-6.

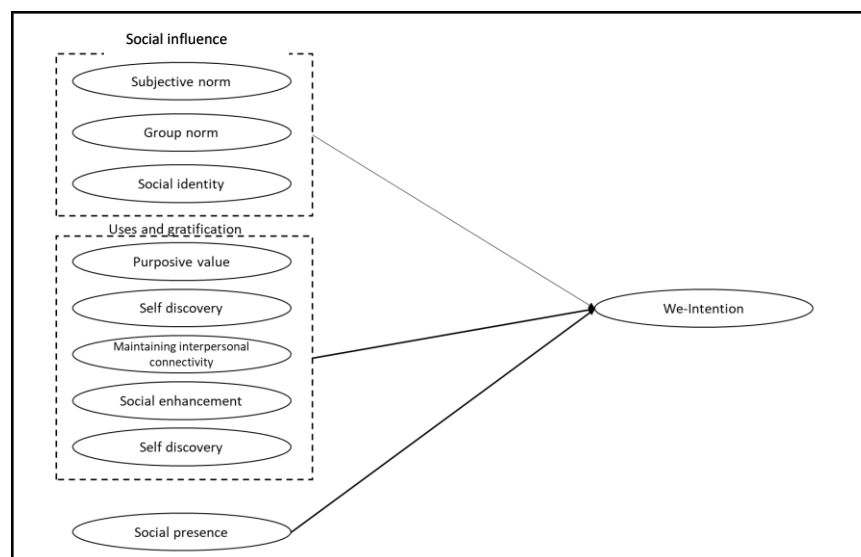


Figure 2-6 We-intention model (C. M. K. Cheung et al., 2011).

For the social influence, it combines the subjective norms; which is the recognizing social pressures to engage or not to engage, group norms; which is to share and refer to the general self-introduction guide to achieve goals and share them with a group of people, and social identity, which is to define their position in the network of people (De Oliveira & Huertas, 2015; A. X. L. Shen et al., 2009; Zhao et al., 2018). While, user gratification assumes that users have goals in their behavior and are aware of their needs. Purposive values, self-discovery, entertainment values, social enhancement and maintaining interpersonal values are core values that are widely used to consider the use of virtual communities (Chan et al., 2014; C. M. K. Cheung et al., 2011; A. X. L. Shen, Lee, et al., 2011). Social presence is the feeling of being present in a meeting with another person. This can be seen when connecting with others in social situations because it creates social status and even interpersonal contact.(A. X. L. Shen, Lee, et al., 2011).

The underlying knowledge of We-intention in the social media dimension will be further discussed in Chapter 3 to develop a conceptual framework and hypotheses of this study.

2.3 Customer relationship management

Customer relationship management (CRM) is a way of managing customer relations by focusing on customer loyalty to the brand, product, service, or organisation, whether to maintain the existing customer not to use the products and services of competitors, increase the number of repeat purchase of existing customers, or pursuit of new customers (Reimann et al., 2009). Previous research has shown that knowledge of CRM is the basis for marketing development (Day, 2004). This in line with many studies in which researchers have argued that the company's practice of leveraging connections with the targeted customers can be the basis for creating a competitive advantage in the market (Baumöl et al., 2016; Reimann et al., 2009; B. Shen et al., 2017). However, some researcher argued that without the interaction to the consumer that are not in the favouring group of customers based on firm values would lead to the choice to opt-out of these relationships (Nguyen et al., 2015).

To summarise, goals of CRM is not only focusing on sales and customer service, but it is a whole process of collecting data on customer behaviour for differentiating the customer's section based on customer needs, engage with consumers to effectively interact with the

consumer, and finally analysing these all information to be used to benefit in the development and improvement of the marketing strategies for future products or services. The basis step of CRM is summarised in Figure 2-7

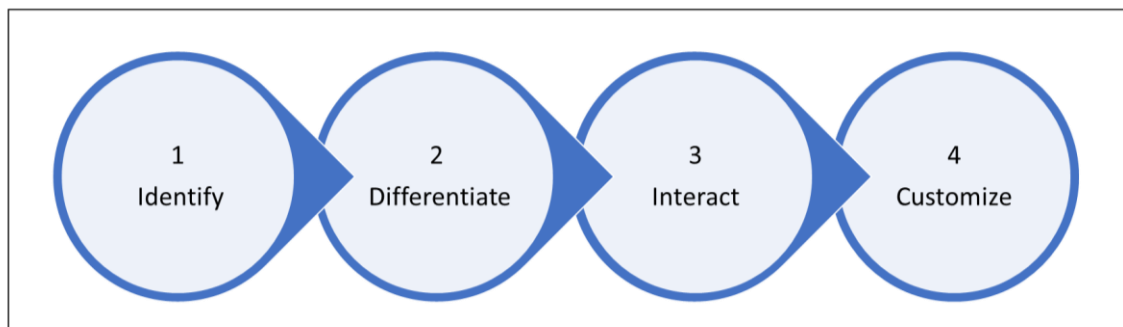


Figure 2-7 Four steps of CRM (modified from Reimann et al., 2009; Shen et al., 2017; Baumöl et al., 2016).

2.3.1 Customer relationship management through social media

CRM has become an essential part of business, especially large corporations, and has received increasing attention from small and medium-sized businesses (Dill & Denesuk, 2013). However, with a significant increase of social media in 2008, CRM began to change to be called CRM 2.0 or Social CRM, from a strategy that solely focuses on customer transactions, into a strategy that combines customer transactions and customer interaction (Greenberg, 2010b). With the development of Web2.0, CRM began a transformation, now named CRM 2.0 or social CRM, from a strategy that was focused on customer transactions to a strategy that incorporated both customer transactions and customer interactions (Baumöl et al., 2016; Greenberg, 2010a; Rodriguez et al., 2015). CRM2.0 is a business philosophy and strategy backed by systems and technologies designed to enable customers to participate in collaborations that deliver mutually beneficial values in a reliable and transparent business environment (Greenberg, 2010). To sum up, social CRM activities encompass the use of social media to publish advertisements that reach broad audiences to improve marketing efficiency.

With the rise of SM, vendors of the Enterprise CRM system began to ask how data from SM can be integrated into an organization's customer database, or technologies such as forums, customer feedback tools, blogs, and community platforms can be integrated to an existing CRM system (Ang, 2011). Social media not only provides an opportunity to

connect to their audience conveniently, but it also helps sellers to share and exchange information amongst their customers (Sashi, 2012). This is because, social media can provide novel and useful ways of interacting and collaborating, as well as for creating new knowledge for innovations (Kärkkäinen & Janhonen, 2011). As a result, engaged customers will become partners to cooperate with vendors in the value-added process to meet their needs. Social media interactions help facilitate the process of creating long-term relationships through a trust and commitment building between sellers and buyers from the creation of emotional bonds for their exchanged relationships (Sashi, 2012). The interactive nature of these digital media not only allows sellers to share and exchange information with their customers but also allows customers to share and exchange information with one another as well. Indeed, the company can create a community using social media tool, for instance, some companies, such as Amazon and TripAdvisor, encourage customers to rate online experiences that everyone can read (Ang, 2011). In other words, customers tend to add value by creating content and even becoming enthusiastic supporters for seller products and can make other people's purchasing decisions in a friend-to-friend interaction (Sashi, 2012).

Greenberg (2010) proposed a model called “community relationship management” (CoRM) and identified that to manage with the connected community, firm need to focus on 4Cs activities including connectivity, conversation, content creation, and collaboration. For **connectivity**, it can achieve by creating SM platform that is easy for users to connect. In this case, he suggests using Facebook as it has a function of recommending a mutual friend (Greenberg, 2010). Facebook also transform the traditional **conversation** online from just communicating through e-mail into the creation of a virtual “wall” which allow others to post and write their messages on it. Organisations can also encourage communities to create and upload their **content** and allow others to comment. This will increase participation levels and, if successful, and it will create an online viral. Organisations can also ask their communities to assist in product development through the **collaboration** of ideas via SM (Greenberg, 2010).

To successfully connect with the community, Sashi (2012) focused her work on the engagement of buyer-seller relationship management and proposed seven steps of customer's engagement cycle including connection, interaction, satisfaction, retention, commitment, advocacy, and engagement. She summarised that a stronger relationship

between the seller and the customer leads to new connections and interactions, creating value to customers and company. Hence, interaction in social media can be created through the use of CRM, and this co-creation of value will be a further study in section 2.3.2

Even though there are many advantages of using social CRM to manage with their customers, many authors still argued about the drawbacks of being concerned. For instance, Dill & Denesuk (2013) pointed out that every conversation on a social media brand page is public and hence visible for anyone to see. Therefore, if individuals post or comment in a bad thing about the company, it will spread to others. This is supported by Baird & Parasnis (2011) that social networking user data can be deceiving. Besides, effective complaint management has a dramatic impact on customer retention, deflects potential word-of-mouth damage, and improves profitability (Cho et al., 2002).

2.3.2 Value creation through social media

Value creation often refers to the value created for users or companies. Bechmann & Lomborg (2013) described many ways that companies can benefit and create value from user participation in SM, including (a) through the networking, status updates, and content contribution ; (b) by participating in company development and innovation and (c) by selling information obtained from users' digital data profiles. This is supported that user profiling can create value for the company (Bechmann & Lomborg, 2013).

The role of the customer in the exchange of value is changing from being a passive actor to be an active participant (Ketonen-Oksi et al., 2016). Traditionally based on a goods-dominant logic, companies have been called as creators of value who try to maintain relationships with the customer in order to maximize profit, where products are buried with the value produced from the market and sold through marketing decisions that maximize the company's profits (Chan et al., 2014). There are, however, a shift into a service-dominant logic (S-D logic). This is because the recent changes in lifestyle, culture and technology have led to changes in marketing concepts and practices in customer relations management (Singaraju et al., 2016). Hence, customers are no longer objects for relationships. They are now the subjects, who voluntarily collaborate with firms, build relations, and participate in value co-creations (Grönroos & Voima, 2013). As highlighted that types of interaction and spheres (provider, joint, and consumer) are leading to the

different form of value creation (Grönroos & Voima, 2013). The value creation sphere is illustrated in Figure 2-8, in which producers act as a facilitator in both provider and consumer sphere. In contrast, in the joint sphere, the consumer participates as a co-producer.

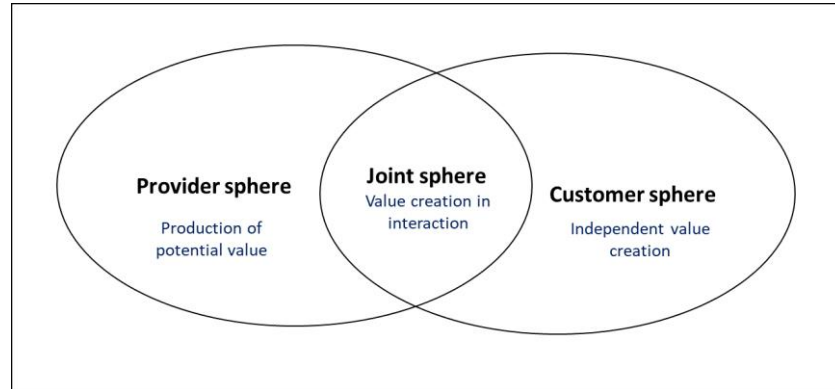


Figure 2-8 Value creation spheres (modified from Grönroos & Voima, 2013).

The explanation of Figure 2-8 will be summarised into Table 2-3 in which the creation of values in each sphere will be identified, and the example in business practice will be suggested.

Table 2-3 Summary of value creation in social media based on types of interaction and spheres (modified from: Grönroos & Voima, 2013).

Sphere	Actors	Inter- action	Value	Value creation	Example
Provider	Provider	In-direct	Value facilitation	The provider facilitates (e.g. produces and delivers) the customer's value creation with resources/ processes that are used and experienced in the customer sphere	The tour operator designs and send a new brochure twice a year to the customer.
Joint	Provider	Direct	Value co-creation	The provider's outcomes interact with the customer's resources in a merge dialogical process	The tour operator service system checks availability and lets the salesperson finalize booking for the trip
	Customer		Value co-creation	The customer's resources/processes interact with the provider in a merge dialogical process	The customer use social media to contact with a tour operator and books the trip for the family
Customer	Customer (individually)	In-direct	Independent value creation	The provider's outcomes interact with the customer's resources in an independent value creation process	Customer read the travel brochure and dream about a vacation (independent individual value creation)
	Customer (collectively)		Independent value-co creation	Other actors interact with customer's in a collective value creation process	College recommend a specific hotel and read the hotel's review in social media

Role of consumers in the value creation has been changed from being isolated to be connected to the industrial system in many ways such as information access, networking, experimentation, and global view (Prahalad, Coimbatore K., 2004). One of the changing aspects is that customer can now access to the information and activities of firm clearer by visiting firm's Facebook page, on the other hands, a firm can get to the information provided by the consumer as they can share, communicate of their experiences and knowledge through the online community (Piller et al., 2012).

In the traditional value creation process, companies and consumers have different roles in production and consumption. Products and services are valuable, and this market is exchanging value from manufacturers to consumers (Amit, R., & Zott, 2001). Value creation occurs outside the market. Nevertheless, when we step forward to making a difference, it will disappear. More and more consumers are involved in the process of designing and creating value. The shared creative experience of consumers becomes the basis of value. However, the future of competition is based on a new way to create value based on creating shared value between consumers and companies (Garrido-Moreno et al., 2020; Rihova et al., 2013; Sashi, 2012). With a new connection tool, consumers want to interact and create value together, not just one company. However, with an entire community of professionals, service providers, and other consumers, the collaborative experience depends on the uniqueness of each person which affects the creation process, including the shared creative experience. A firm cannot create value without individual involvement (Prahalad, Coimbatore K., 2004).

Shao (2009) differentiates between the levels and types of consumer's engagement with brands on social media by proposing the consumer's online brand-related activities (COBRA) framework. The COBRA framework is a behavioural structure that covers consumer activities related to brand-related content on social media. Considering the increasing role of branding and brand communication on social media, researchers and practitioners need to have measurement tools that cover activities related to various social media brands engagement from a consumer's perspective (Baumöl et al., 2016; Muntinga et al., 2011; B Schivinski et al., 2016). The summarise of COBRA framework is given in Table 2-4

Table 2-4 COBRA typology as a continuum of three engagement types; consumption, contribution and creation (Shao, 2009).

	COBRA type	Examples of brand-related social media use
<div> <div>Low</div> <div> <div></div> <div>Level of brand related- activeness</div> <div></div> </div> <div>High</div> </div>	Consumption	<ul style="list-style-type: none"> • Viewing brand-related videos • Listening to brand-related audio • Watching brand-related pictures • Following threads on online brand community forums • Reading comments on brand profiles on SNSs • Reading product reviews
	Contribution	<ul style="list-style-type: none"> • Rating products and/or brands • Joining a brand profile on a SNSs • Engaging in branded conversations, e.g. on online brand community forums or SNSs • Commenting on brand-related weblogs, video, audio, pictures, etc.
	Creation	<ul style="list-style-type: none"> • Publishing a brand-related weblog • Uploading brand-related video, audio, pictures, or images • Writing brand-related articles • Writing product reviews

Note: this list of examples of brand-related social media use is not exhaustive – COBRAs come in countless forms. The examples mentioned are based on literature of Shao (2009).

In this study, value creation is divided into three levels based on the COBRAs framework, in which the basement level of engagement in social media is a consumption. In contrast, the generation higher values to the company are divided into contribution's value and creation's value. Details and a developed scale to measure these engagement's value to a company is provided in Chapter 3.

2.4 Environmental awareness and social media

Environmental issues are important to all stakeholders in the whole supply chain including manufacturers, service providers, consumers, and government agencies. All activities in the supply chain have great impacts on the environment. The consumption culture of consumers in the twentieth century has caused environmental degradation and adverse effects on health and ecosystems. Despite these concerns, consumers are still unable to purchase environmentally friendly or green products due to lack of awareness and beliefs about the benefits of environmental thinking (Ojiaku et al., 2018). Numerous studies have shown that human activities cause environmental damage. This is demonstrated by activities that produce chemicals for the soil, air and water in industries, and household waste cause pollution and damage to the environment (Ojiaku et al., 2018; Tate & Bals, 2018; Zheng et al., 2018). However, humans are the key managers of the environment, who have the ability and expertise to manage the environment and continually use their resources (Ningrum et al., 2018).

Environmental education for young people is the most important, as young people are the primary driver of a sustainable future, especially for students with higher education (Cruz & Tantengco, 2017). Students are one component of society that is expected to be the next generation and to preserve the environment and natural resources. The education that students receive from educational institutions will have a positive impact on the development of environmental awareness (Abun et al., 2019; Cruz & Tantengco, 2017). Students at higher education or university are an essential part of respond to reduce environmental problems and take profound responsibility to increase awareness of creating a sustainable future (Abun et al., 2019; Cruz & Tantengco, 2017; Ningrum et al., 2018; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019).

However, Cruz & Tantengco (2017) identified the environmental awareness and practices of students at the Sta Elena High School in the Philippines and indicated that in participants in their research only adopted a limit of environmental preservation activities i.e. recycling, conserving water and energy, and using harmful products. Besides, Yildiz & Budur (2019) observed the attitude of environmental awareness for college students, and they found that student have a good attitude towards a planting trees, monthly cleaning, seminars on reuse and recycling. Moreover, the result is shown

that students will gain a higher level of environmental awareness when they learn from their friends (Yildiz & Budur, 2019).

To encourage the environmental awareness, Yin & Law (2019) used a knowledge of TPB to examine the factors that influence Malaysian plastic bag behaviour and they explored that social influences have a positive effect on anti-plastic bag behaviour. This result of Yin & Law is, however, in the opposition to the results in the study of Ozdemir & Alkabbanie (2017) who examined the role of social media in raising environment awareness among young generation using a case study of computer engineering student in Tishk International University in Kurdistan. The findings revealed that SM was found to be an ineffective method of raising the environmental awareness among the higher education students in Kurdistan. The ineffective roles of social media in the work of Ozdemir & Alkabbanie can be explained by the work of Amir Rahim et al. (2019), who studied on the audience roles and reactions towards the environmental awareness campaign in SM, and they explored that the failure factors of today's environmental awareness campaign are mainly because of the use of unclear and unreasonable information.

Besides, the roles of social media in encouraging the environmental awareness have been confirmed in a variety of studies, regarding to the ***age of participant*** by the study of Severo et al. (2019) who compared the influence of social networks on environmental awareness and the social responsibility by generations of participants (baby-boomer, X, Y), or ***cross-national comparison*** by Mayerl & Best (2019) who observed attitudes and behavioural intentions to protect the environment in a different nation, or cost and living place (city or rural) from (Byrka et al., 2017), and towards the niche market such as the environmental awareness on organic food purchase (Kusumaningsih et al., 2019). All of these studies confirmed that there is a correlation between the use of social media and the increase of environmental awareness.

The social media has become a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness, but none of them focuses on the opposite side which is

how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company.

Therefore, it is necessary to ensure that the attitude about environmental awareness contributes to the engagement in social media, especially to co-create value to the company. Further, analysis needs to be carried out about the relationship between environmental awareness and engagement in social media among students in dealing with value creation aspect. Since there have yet to be any literature studies regarding this topic, this study needs to be done to explore the role of students' environmental awareness to the value creation in SM. This research can contribute to the company, especially for the marketer, to understand how the customer's environmental attitude is related to the engagement and creation of value to the company. Firms can use the results of this study in the classification of their customers, and further segment their product or service to serve with the right types of customers based on their behavioural in SM from their attitudinal of environmental.

In the study of attitudinal of environmental awareness in social media, most of the study apply a revised of New Ecological Paradigm (NEP) scale in measuring of endorsement of a "pro-ecological" behaviour (Hynes & Wilson, 2016; Ogunbode, 2013; Srbnovski et al., 2020). However, this scale has a disadvantage in applying to justify the attitudinal phase of environmental awareness because it combines all element into one main set of questions which hard to distinguish between the dimensional of environmental attitude. Generally, the attitudinal of environmental awareness comprises of three dimensions; cognitive, affective, and conative (Gifford & Sussman, 2012). Cognitive environmental awareness is related to the environmental knowledge, affective environmental awareness is involved with the emotional attitude, and conative environmental refers to the connection of knowledge and affect to behaviour and is associated with the issue of "why." (Ferguson et al., 1974; Zubair & Chotib, 2020). Most of existing study on the components of attitudinal of environmental awareness focus on the offline environmental behaviour such as green purchasing (Trivedi et al., 2018), green product (Fletcher et al., 2016) This research, therefore, will apply a revised scale for the measurement of ecological attitudes and knowledge, which is firstly proposed by Maloney (1975) as a basis measurement scale to justify an attitudinal of environmental awareness based on their different dimension of attitudinal environmental awareness.

2.5 Research gaps and questions

2.5.1 Research gaps

As emphasised in the introduction chapter, this study seeks to address two research gaps in the current literature.

Gap1: There is a lack of understanding on how the consumers create different value to the company in social media

Role of consumers in the value creation has been changed from being isolated to be connected to the industrial system in many ways such as information access, networking, experimentation, and global view (Prahalad, Coimbatore K., 2004). One of the changing aspects is that customer can now access to the information and activities of firm clearer by visiting firm's Facebook page. On the other hands, a firm can get to the information provided by the consumer as they can share, communicate of their experiences and knowledge through the online community (Piller et al., 2012). Even though social media usage is widespread, yet previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape (Baumöl et al., 2016; Fletcher et al., 2016; Garrido-Moreno et al., 2020; Rodriguez et al., 2015). This is because, a research on mechanisms that control these specific customer engagement behaviours (CEBs) on social media brand platforms is limited (Jayasuriya & Azam, 2017; Suseno et al., 2018). Numerous studies have examined various factors affecting the use of online social networking sites (SNS). However, investigations of these factors are still under development, especially in the context of Thailand.

Even if Thailand is known for one of the tops of social media users, especially for Facebook, which has an active user approximately 50 million, which is accounted for 74 % out of total Thai population (Lee-sanguansuk, 2019; Norcross, 2019). However, most of the SM study in Thailand have limit to the use of SM on purchase intention or tourism perspective. There is a lacks study in the behavioural of SM user in Thailand perspective. In this study, we aim to participate in literature by expanding and testing existing conceptual concepts in these contexts, especially to examine how is the antecedence of customer's engagement in social media impact to the Thai customer's value creation to SM.

Gap2: The difference in attitudinal environmental awareness on the engagement to the company in social media remain under explored

The social media has become a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness and, but none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company.

There are, however, still lacks the work of exploring the relationship between environmental behaviour even there is a current trend of “green thinking” worldwide. Most of the studies on customer environmental behaviour are mainly focus on educational, or product and packaging design (Byrka et al., 2017; Lyon & Montgomery, 2013; Minton et al., 2012).

Therefore, it is necessary to ensure that the attitude about environmental awareness contributes to the engagement in social media, especially to co-create value to the company. Further, analysis needs to be carried out about the relationship between environmental awareness and engagement in social media among students in dealing with value creation aspect. Since there have yet to be any literature studies regarding this topic, this study needs to be done to explore the role of students’ environmental awareness to the value creation in SM. This research can contribute to the company, especially for the marketer, to understand how the customer’s environmental attitude is related to the engagement and creation of value to the company. Firms can use the results of this study in the classification of their customers, and further segment their product or service to serve with the right types of customers based on their behavioural in SM from their attitudinal of environmental.

2.5.2 Overarching research question

To address the identified research gaps, the following research aim is proposed.

To explore the moderation role of environmental awareness on the relationship between customer engagement and value creation in social media in the context of Thai university student

This research aim addresses the identified gaps simultaneously, as the beginning of the study is to focus on how the antecedence of customers behavioural intention impact to the engagement in social media (addresses the 1st gap) and the latter is focussing on how attitudinal on environmental awareness can effect to those relationship in creating value to the company in social media. Accordingly, two RQs are formulated to achieve the research aim and provide guidance on the project.

RQ1: How are the antecedence of customer's behavioural intention (trust, social presence, social influence, and rewards) impact to the engagement and value creation in social media.

RQ2: How do the environmental awareness of customer effect to the relationship between customer engagement and value creation in social media (contribution, creation).

The first RQ is necessary to understand the impact of customer's behavioural intention to the engagement and value creation on social media. In this study, antecedences of customer behavioural intention are developed from the combination of Theory of Planned Behaviour and We-intention framework, While the engagement and value creation in social media are developed based on the knowledge of CRM with the application of consumer's online brand-related activities (COBRA) framework.

The second RQ helps to understand the role of environmental awareness on the relationship between customer engagement and value creation. In this study, the author applies the attitudinal of environmental awareness (cognitive, affective, and conative) towards the engagement (consumption) and value generation in social media (contribution, and creation) based on COBRA framework. Details of the generation of conceptual framework and hypotheses development will be further discussed in Chapter

2.6 Chapter summary

The key findings of this chapter are summarised in Table 2-5

Table 2-5 Summary of key findings in literature review chapter

<p style="text-align: center;">Social media literature</p> <p>Definition: Social media is a group of Internet-based applications built on the ideological and technological foundations of Web 2.0 that allow the creation and exchange of contents and encompasses various types of applications through the internet based and gives users quick electronic communication of content.</p> <p>Types: Classification categories of social media regarding the purpose of use distinguished as media sharing sites, blogs and microblogs, social bookmarking sites, social networking sites, social opinion-sharing sites, and virtual worlds. However, which this study will only focus on the most popular social networking site which is Facebook.</p> <p>Application of SM to business and supply chain management: Even if research in SM is widely discussed in CRM area, however, there is still a lack in bridging the knowledge of customer's intention and value creation in social media, especially in the context of Thailand.</p> <p>Underpinning theory of SM: The application of TPB and We-intention is used as a basis knowledge of customer's engagement in social media.</p>
<p style="text-align: center;">Value creation in social media</p> <p>Value creation in social media are developed based on the knowledge of CRM with the application of consumer's online brand-related activities (COBRA) framework</p>
<p style="text-align: center;">Environmental awareness and social media</p> <p>Apply a revised scale for the measurement of ecological attitudes and knowledge in the justification of an attitudinal of environmental awareness based on their different dimension of attitudinal environmental awareness.</p>
<p style="text-align: center;">Gaps</p> <p>Gap1: There is a lack of understanding on how the consumers create different value to the company in social media</p> <p>Gap2: The difference in attitudinal environmental awareness on the engagement to the company in social media remain under explored</p>
<p style="text-align: center;">Research aim</p> <p>To explore the moderation role of environmental awareness on the relationship between customer engagement and value creation in social media in the context of Thai university student</p>
<p style="text-align: center;">Research questions</p> <p>RQ1: how are the antecedence of customer's behavioural intention impact to the engagement and value creation in social media.</p> <p>RQ2: How do the environmental awareness of customer effect to the relationship between customer engagement and value creation in social media</p>

3 Theoretical development and hypotheses

3.1 Chapter overview

It is based upon the conceptualization outline in Chapter 2, this chapter combining the knowledge under the theory of planned behaviour together with We-intention framework, with the attitudinal dimension of environmental awareness to propose a theoretical framework of customer's value creation in social media. This chapter will be started with a comprehensive outline of the theoretical framework in Section 3.2. Then, a set of empirically developed hypotheses will be presented in section 3.3. Finally, the summary of this chapter will be concluded in section 3.4 with an illustration of a conceptual model. A structure of this chapter is illustrated in figure 3-1

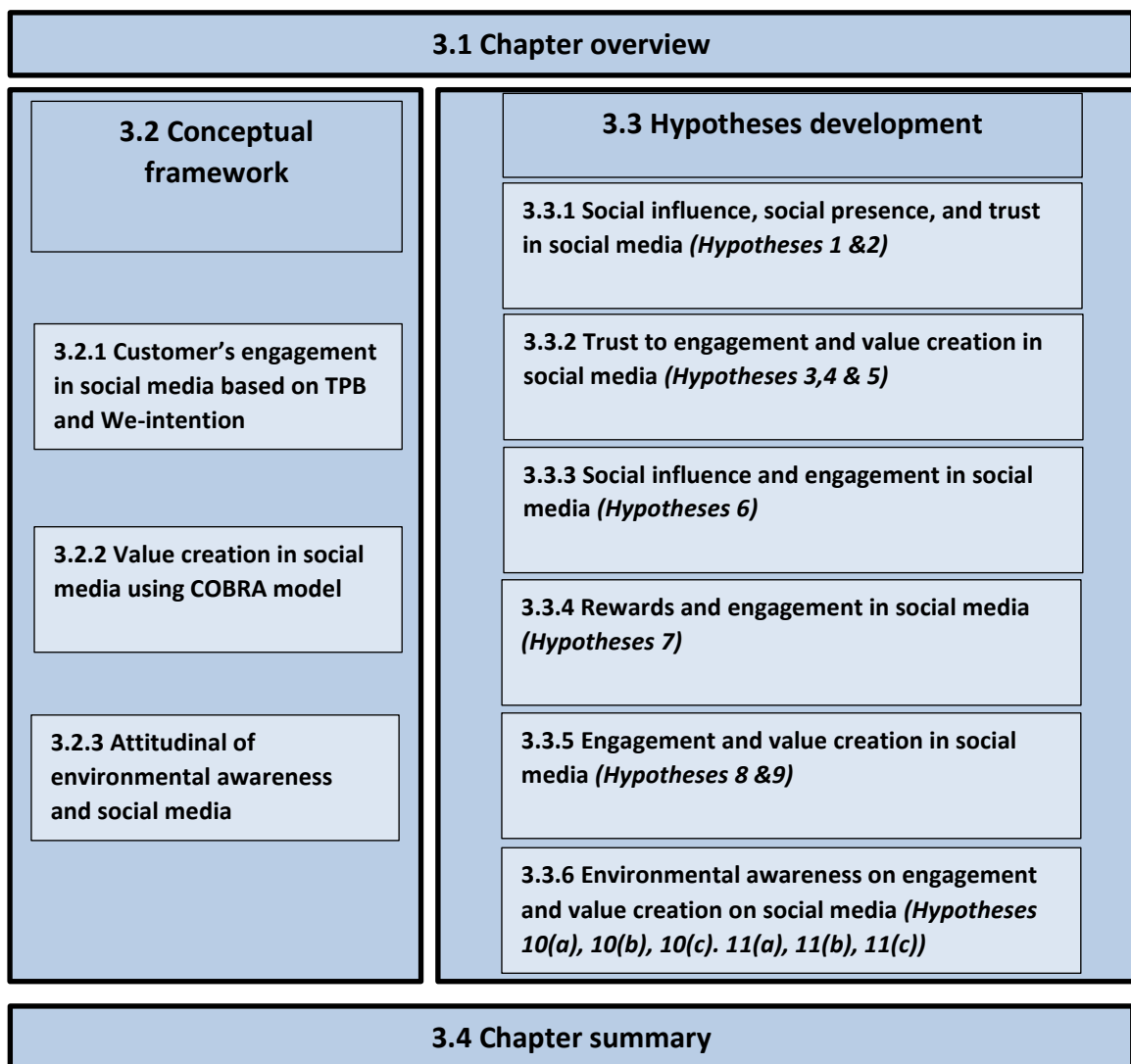


Figure 3-1 A structure of theoretical development and hypotheses chapter

3.2 Conceptual framework

Conceptual framework of this study is developed based on the three main components of the study including a knowledge behind customer's engagement in social media, value creation in social media, and environmental awareness and social media perspective. The first component of the conceptual framework will be explained in section 3.2.1 based on Theory of planned-behaviour (TPB) and We-intention framework, followed by the clarification of the development of the conceptual framework in terms of value creation regarding consumer's online brand-related activities (COBRA) model in section 3.2.2, and exploring the application of attitudinal dimension of environmental awareness in the context of social media in section 3.2.3

3.2.1 Customer's engagement in social media based on TPB and We-intention

The study firstly develops a knowledge of customer engagement in social media based on the theory of planned behaviour (TPB) which was initially created by Ajzen and Fishbein in 1975, as the primary purpose of overcoming the limitation in the theory of reason action (TRA) (Ajzen, 2012; Madden et al., 1992; Ngai et al., 2015; Oreg & Katz-Gerro, 2006). In terms of study in the social media area, many researchers developed knowledge with the use of TPB as an underlying theory. It was starting with Thorbjørnsen et al. (2007) who investigated the role of subjective norms towards a self-identity expressiveness and social identity expressiveness, which resulted in the intention to use a Multimedia Messaging (MMS) in Norway. The results revealed that subjective norms solely were not sufficient to capture the luxurious universe of social identity and social influences which driving behavioural intentions. This result is in line with many pieces of literature which captured the TPB and provided that intentions to do something are not only based on the normative belief, but it is also needed to consider behavioural and control belief (Ajzen, 2012; Ajzen & Icek Ajzen, 2006; Orbell et al., 1997). To point out this, Zoonen et al. (2014) explored the interrelating roles of subjective norms and perceived behavioural control as it positively correlates in influencing the intention to engage in work-related social media use.

Moreover, Neuwirth & Frederick (2004) used the TPB to explore the social influence roles on communication-related to drinking behaviour. They suggested that the influence of

peer pressure or social influence relate to the willingness to express their opinions. While, Saeri et al. (2015) highlighted that social influence and online identity is found to be a significant antecedent of trust, which also leads to engagement in social media. Chan et al. (2014) expanded the knowledge of engagement by classified the customers engagement in online brand communities into different definitions including, customer engagement which is a process of building a customer's loyalty, brand engagement in which a company try to communicate their brand value to the consumer, and customer-brand engagement which focus on customer's trust and brand commitment that leading to the customer's satisfaction. They also investigated an antecedence of customers engagement and hypothesize that trust and self-benefits were leading to online engagement, with the empirical results support that these two factors are positively influencing the level of engagement which resulted in word-of-mouth intention and purchase intention. This result is consistent with the work of Wang & Abdullayeva (2011) who extended the knowledge of TPB to identify the relationship between use of social media and customer relationship in the E-commerce perspective, and they found that trust is a crucial mediating role in effectively corroborate with the customer on social media. To the light of these, an intention to do something in social media is driving by a correlation between social influence and social identity, which is also mediated by trust.

Previous research has shown that the creation of TPB, including social influence, and social identity, are essential factors in determining the acceptance and use of various information technology. However, these factors are not sufficient to explain users' ongoing intentions in the social media perspective, especially in an online shopping context (Hsu et al., 2006). Hence, it is required to integrate this knowledge with others. Hansen et al. (2018) integrated the structure from the Technology Adoption Model (TAM) with the Theory of Planned Behavior (TPB), and they found out that it is useful to integrate concepts from both theories instead of relying on just one theory. Chou & Chang (2008) combined the knowledge of TPB with the social capital theory to investigated factors effecting to knowledge creation in electronic networks. Results showing that the influence of social capital on knowledge creation effectively becomes an important issue to be addressed with the subjective norms.

However, in this study, the author will combine a theory of TPB with the knowledge of We-intention because the engagement in social media is not only come from an

individual's preference as it happens in TPB. Nevertheless, it also comes from our society influence as we are a part of society. In the present study, engagement in social media is thought to be a social action using reference groups, and most of the researcher intentionally reflect the perceptions of groups acting as a unit (C. M. K. Cheung et al., 2011; De Oliveira & Huertas, 2015; K. Wang et al., 2018; N. Wang & Sun, 2016). This is supported by the work of (A. X. L. Shen et al., 2009; A. X. L. Shen, Cheung, et al., 2011) who explored the ancestors and the consequences of We-intentions and Individual-intentions (I-intentions) in an open web encyclopedia. The research model has been developed and empirical investigations with 202 educators in the two most popular encyclopedia communities in mainland China. Results show a shared commitment, collective agreement and expectations of community-related outcomes are significantly correlated with We-intention but not related to I-intention. Besides, We-intentions have a significant positive effect on contribution behaviour, while I-intend negatively relates to contribution behaviour. We-Intention is determined by factors that influence society such as subjective norms, group norms and social identity, social presence, and others satisfaction factor (C. M. K. Cheung et al., 2011). Previous studies have identified social influences and personal benefits as two crucial mechanisms to understand users' acceptance of social media. It is found that social influence factors play a more critical role for high-sociability media users, while individual beneficial have more substantial impacts on the intention for low-sociability media users (N. Wang & Sun, 2016). This is to conclude that social presence and personal beneficial in We-intention model relates to the action in social media. Shin (2010) further investigated roles of safety, reliability, and social presence on social networking websites among consumers using both reliable scales and measures. The finding also revealed that social presence would control the impact of perceived privacy on trust. This study of Shin is also in line with the study of Lowry et al. (2010), they focus on the role of social presence on trust in a multicultural group consisting of participants from China and the United States, which result also confirmed that social presence has a positive impact on trust among members. In conclusion from the knowledge of TPB with We-intention, the findings from existing studies suggest that intention to do something in social media are based on the combination of social influence, social presence and identity, which trust is also a mediator of these two factors towards intention on SM, also, personal benefits are needed to be included in the model.

3.2.2 Value creation in social media using COBRA model

Traditionally, companies and customers have different roles in the value creation process as a company is a producer and customers are a buyer for products or services which are valuable. This market is exchanging value from manufacturers to consumers (Amit, R., & Zott, 2001). This is because the recent changes in lifestyle, culture and technology have led to changes in marketing concepts and practices in customer relations management (Singaraju et al., 2016), especially with the advent of SM, more and more consumers are involved in the process of designing and co-creating value, not just one company. However, with an entire community of professionals, service providers, and other consumers, the collaborative experience depends on the uniqueness of each person which affects the creation process, including the shared creative experience (Garrido-Moreno et al., 2020; Rihova et al., 2013; Sashi, 2012). Hence, customers are no longer objects for relationships. They are now the subjects, who voluntarily collaborate with firms, build relations, and participate in value co-creations (Grönroos & Voima, 2013).

With a new connection tool, consumers want to interact and create value together. A firm cannot create value without individual involvement (Prahalad, Coimbatore K., 2004). The role of the customer in the exchange of value is changing from being a passive actor to be an active participant (Ketonen-Oksi et al., 2016). Shao (2009) differentiates between the levels and types of consumer's engagement with brands on social media by proposing the consumer's online brand-related activities (COBRA) framework. The COBRA framework is a behavioural structure that covers consumer activities related to brand-related content on social media. Considering the increasing role of branding and brand communication on social media, researchers and practitioners need to have measurement tools that cover activities related to various social media brands engagement from a consumer's perspective (Baumöl et al., 2016; Muntinga et al., 2011; B Schivinski et al., 2016). Value creation is divided into three levels based on the COBRAs framework, in which the basement level of engagement in social media is a consumption. In contrast, the generation higher values to the company are divided into contribution's value and creation's value (Damron, 2017; Bruno Schivinski, 2019). A COBRA framework is applied as basic knowledge in their justification of value creation in many areas. M. L. Cheung et al. (2019) explored the impact of social media marketing efforts, including entertainment, customization, interaction, and trends on consumption, contribution and

creation behaviours on social media pages, using a case of We chat in the high-end cosmetics industry in China. Results revealed that contribution behaviour related to the increase of on-going search behaviour (OSB) only, while creation behaviour related to OSB and repurchase intention. This result of M. L. Cheung et al is consistency with the study of Bruno Schivinski (2019) who summarised that the action of the customer from value-creation behaviour is low, medium, and high regarding consumption, contribution, and creation behaviour respectively. This view is supported by pieces of literature in a different scope of the study, including Gruss et al. (2020) who confirmed the different value-creation in SM based on SM data analytics in the restaurant industry, and Vale & Fernandes (2018) who focused their research on the driving fan engagement with football clubs on Facebook, in which the higher engagement of consumer-led to the higher level of value generation to the football club in social media, or indifferent SM platform which is Facebook, YouTube, LinkedIn, Twitter, Google+, Instagram, Pinterest by (Voorveld et al., 2018). Damron (2017), however, highlighted consumption as a basis of engagement in SM, which can further create the contribution and creation. In his study, he compared this continuum consumption (minimal activity, such as watching videos), engagement (moderate activity, such as participation in brand discussions) and creation (top-level activities such as uploading Facebook content) in three industrial areas automotive Industry (Toyota), apparel Industry (Nike), and luxury Industry (Louis Vuitton). The results are conforming with the study of Bruno, Gruss, and Vale & Fernandes except for the luxury industry in which the higher engagement in social media did not increase the higher value to the company. This is because the luxury industry is a specific area in which sometimes related to the “less is more” terminology.

To conclusion, value creation in SM in this research can be classified into low, medium, and high regarding consumption, contribution, and creation behaviour. The consumption, however, is a basis of engagement in social media, and it can leads to contribution and creation of value to the company later on.

3.2.3 Attitudinal of environmental awareness and social media

Environmental awareness has been highlighted as a current trend of study due to the more sustainable thinking of consumer nowadays. Yin & Law (2019) used knowledge of TPB to examine the factors that influence Malaysian plastic bag behaviour, and they explored that social influences have a positive effect on anti-plastic bag behaviour. This

result of Yin & Law is, however, in opposition to the results in the study of Ozdemir & Alkabbanie (2017) who examined the role of social media in raising environmental awareness among young generation using a case study of a computer engineering student in Tishk International University in Kurdistan. The findings revealed that SM was found to be an ineffective method of raising environmental awareness among the higher education students in Kurdistan. The ineffective roles of social media in the work of Ozdemir & Alkabbanie can be explained by the work of Amir Rahim et al. (2019), they studied the audience roles and reactions towards the environmental awareness campaign in SM. They explored that the failure factors of today's environmental awareness campaign are mainly because of the use of unclear and unreasonable information. Besides, the roles of social media in encouraging the environmental awareness have been confirmed in a variety of studies, regarding the age of participant by the study of Severo et al. (2019), nationality by Mayerl & Best (2019), or cost and living place by (Byrka et al., 2017), and towards purchase intention (Kusumaningsih et al., 2019). All these studies confirmed that there is a correlation between the use of SM and the increase of environmental awareness. The SM has become a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness and, but none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company. Moreover, most of the studies apply a revised of New Ecological Paradigm (NEP) scale in measuring of endorsement of a "pro-ecological" behaviour (Hynes & Wilson, 2016; Ogunbode, 2013; Srbinovski et al., 2020). However, this scale has a disadvantage in applying to justify the attitudinal phase of environmental awareness (cognitive, affective, conative) because it combines all elements into one central set of questions which hard to distinguish between the dimensional of environmental attitude (Gifford & Sussman, 2012). This research, therefore, will apply a revised scale for the measurement of environmental attitudes and knowledge, which is firstly proposed by Maloney (1975) as a primary measurement scale to justify an attitudinal of environmental awareness because they classified the scale into different groups based on their different dimension of attitudinal environmental awareness.

3.3 Hypotheses development

3.3.1 Social influence, social presence, and trust in social media

For the social influence, it combines the subjective norms; which is the recognising social pressures to engage or not to engage, group norms; which is to share and refer to the general self-introduction guide to achieve goals and share them with a group of people, and social identity, which is to define their position in the network of people (De Oliveira & Huertas, 2015; A. X. L. Shen et al., 2009; Zhao et al., 2018). While social presence is the feeling of being present in a meeting with another person, this can be seen when connecting with others in social situations because it creates social status and even interpersonal contact (A. X. L. Shen, Lee, et al., 2011). Previous studies have identified social influences and social presence as two essential mechanisms to understand users' acceptance of social media (Calefato et al., 2015; Gefen & Straub, 2004). It is found that social influence factors play a more critical role in high-sociability media users (N. Wang & Sun, 2016). While the importance of social presence on trust is getting higher when the rules and customs are not sufficient, people rely on trust and familiarity as primary mechanisms to reduce social uncertainty (Gefen & Straub, 2004). This is highlighted by Hamilton & White (2012) with the higher role of social influence on trust to the young people. Hence, social presence and social influence relates to the action in social media. Shin (2010) further investigated roles of safety, reliability, and social presence on social networking websites among consumers using both reliable scales and measures. The finding also revealed that social presence would control the impact of perceived privacy on trust. This study of Shin is also in line with the study of Lowry et al. (2010), they focus on the role of social presence on trust in a multicultural group consisting of participants from China and the United States, which result also confirmed that social presence has a positive impact on trust among members. Besides, Calefato et al. (2015) also confirmed the role of social presence and social influence in the affective commitment of customers:

- Hypotheses:
- 1 Social influence will have a positive and significant effect on customer-brand trust in social media
 - 2 Social presence will have a positive and significant effect on customer-brand trust in social media

3.3.2 Trust to engagement and value creation in social media

Trust and consumer's engagement have been widely studied. Giampietri et al. (2018) used SEM to confirm the role of trust as it comes before consumers' willingness to buy short-chain food. Besides, T. Zhou (2011), highlighted the need to build initial trust to help simplify user behaviour of mobile banking usage. In terms of trust and social media, George (2004) examined the relationship between trustworthiness in SM including beliefs about perceiving behavioural control, and the expectations of other important people and online buying habits. Data indicates that trustworthiness have a positive effect on buying behaviour. One way to increase trust is through social and cultural similarities. Gefen et al. (2005). examine the role of trust in implementing IT in different cultures, which have different concepts of socially acceptable behaviour, and the study compares trust-related perceptions of an emerging IT (i.e., electronic voting) between the United States of America (USA) and the Republic of South Africa (RSA). The result was showing that trust contributes to the perceived usefulness (PU) of the IT. The results suggest that when cultural diversity is broad, trust becomes of lesser importance (Gefen et al., 2005). McLaughlin & Stephens (2019) investigated the social media adoption intentions of SME owner; they found that surprisingly, the driver of the trust does not have a significant relationship to social media adoption intention for SME owners. These findings do not support previous research (Gefen et al., 2005; Lowry et al., 2010; Shin, 2010; T. Zhou, 2011) Which shows the critical roles these players have. Therefore, even if there is a perceived risk level by the SME owner or manager, this will not affect the usage decision. However, it should be noted that most of the previous research has been focused on e-commerce adoption and transaction in the online platform. This difference in the current study leads to the gap to explore whether a trust is a significant impact on the participation in social media, which then leads to the value generation or not. Hence:

Hypotheses: 3 customer-brand trust in SM will have a positive and significant effect on the SM consumption

4 customer-brand trust in SM will have a positive and significant effect on the value contribution to the company

5 customer-brand trust in SM will have a positive and significant effect on the value creation to the company

3.3.3 Social influence and engagement in social media

In the present study, engagement in social media is thought to be a social action using reference groups, and most of the researcher found that customers reflect the perceptions of groups as their perceived intention. (N. Wang & Sun, 2016; Cheung et al., 2011; De Oliveira & Huertas, 2015; A. X. Shen et al., 2010; K. Wang et al., 2018). This view is supported by the study of Neuwirth & Frederick (2004) that peer influence and perceptions of majority attitudes were associated with willingness to voice an opinion. Pelling, E. L., & White (2009) focused their research on young people by investigating how the model of the theory of planned behaviour (TPB), including the additional variables of self-identity and belongingness related to the user intentions and behaviour in social media. They found that subjective norms and self-identity, which is a component in social influence, become a significant predictor of their willingness to participate in high-level SNSs usage, suggesting that young people who have a right attitude towards using high level of SNSs and those who feel pressured by others to use these high levels are more likely to intend to participate in higher-level SNSs. In a classification of the component of social influence on the level of engagement in SM, Thorbjørnsen et al. (2007) demonstrated that the effect of group norm is more significant for users with lower usage experience.

In contrast, the effect of social identity is more significant for users with higher user experience. This result is complying with the study of N. Wang & Sun (2016) that social influence factors play a more critical role for high-sociability media users while attitude has more substantial impacts on the intention for low-sociability media users. Hamilton & White (2012) confirmed the result of Pelling, E. L., & White as they found that social influence, especially, for the relevant person, which in this case is family, impacted to the engagement in social media mainly to the young people. This results also compare the effect of social influence on both sexes, and they found that social influence is vital to both sexes in engagement in SM.

Therefore, the study hypothesised that:

Hypotheses: 6 Social influence will have a positive and significant effect on the consumption in SM

3.3.4 Rewards and engagement in social media

Higher rewards reflect higher satisfaction, increase excessive consumer awareness, and the attractiveness of brand relationships, thereby increasing the customer's willingness to continue to contact to the brand (Hamilton et al., 2016). Economic theory suggests that the willingness to participate in an exchange transaction depends on the customer's expectations of receiving the surplus of the consumer from the transaction (Chan et al., 2014). Many researchers confirmed that rewards would promote customer engagement in online brand communities (Jang et al, 2008; Kim et al, 2008). In the study of Cheung et al. (2011), they classified the rewards based on the beneficial values into five main values which are purposive value, self-discovery, social enhancement, maintaining interpersonal interconnectivity, and entertainment value. In which a purpose is a value obtained from the achievement of the objectives of the data and predefined tools, self-discovery is to finding ourselves means understanding and deepening your own perspective through social interactions. Maintaining interpersonal relationships means the social benefits that are gained from establishing and maintaining contact with others, such as social support, friendship, and intimacy (Gefen & Straub, 2004). Social enhancement refers to the value that a participant derives from the acceptance and approval of other members and the improvement of the social status of one within the community due to its support. And entertainment value refers to fun and relaxation through playing or interacting with others (Chan et al., 2014; De Oliveira & Huertas, 2015; Zheng et al., 2018).

The benefits of using social media are positively correlated with the client's intentions. However, not every item has similar importance, functions (convenience, efficiency, information, sharing of experience) and financial benefits. (Free coupons, discounts, special offers) from social media have found a significant positive impact on customers (Song & Yoo, 2016). While, Sreejesh et al. (2014) suggested that in term of financial benefits, it should be divided into monetary and nonmonetary rewards for relationship maintenance. In addition, social and psychological rewards are being found to have an impact on the engagement in social media (Garrido-Moreno et al., 2020; Hamilton et al., 2016; Song & Yoo, 2016).

Therefore, the study hypothesised that:

Hypotheses: 7 Reward will have a positive and significant effect on the consumption in SM

3.3.5 Engagement and value creation in social media

The role of the customer in the exchange of value is changing from being a passive actor to be an active participant (Ketonen-Oksi et al., 2016). Traditionally based on a goods-dominant logic, companies have been called as creators of value who try to maintain relationships with the customer in order to maximize profit, where products are buried with the value produced from the market and sold through marketing decisions that maximize the company's profits (Chan et al., 2014). There are, however, a shift into a service-dominant logic (S-D logic). This is because the recent changes in lifestyle, culture and technology have led to changes in marketing concepts and practices in customer relations management (Singaraju et al., 2016). Hence, customers are no longer objects for relationships. They are now the subjects, who voluntarily collaborate with firms, build relations, and participate in value co-creations (Grönroos & Voima, 2013). With a new connection tool, consumers want to interact and create value together, not just one company. However, with an entire community of professionals, service providers, and other consumers, the collaborative experience depends on the uniqueness of each person which affects the creation process, including the shared creative experience. A firm cannot create value without individual involvement (Prahalad, Coimbatore K., 2004).

Shao (2009) differentiates between the levels and types of consumer's engagement with brands on social media by proposing the consumer's online brand-related activities (COBRA) framework. The COBRA framework is a behavioural structure that covers consumer activities related to brand-related content on social media. Considering the increasing role of branding and brand communication on social media, researchers and practitioners need to have measurement tools that cover activities related to various social media brands engagement from a consumer's perspective (Baumöl et al., 2016; Muntinga et al., 2011; B Schivinski et al., 2016). To conclusion, the consumption, however, is a basis of engagement in social media, and it can leads to contribution and creation of value to the company later on.

Therefore, the study hypothesised that:

Hypotheses: 8 SM consumption will have a positive and significant effect on the value contribution to the company

9 SM consumption will have a positive and significant effect on the value creation to the company

3.3.6 Environmental awareness on engagement and value creation on social media

The involvement of media and social media, especially in the creation of environmental awareness in the target audience, is crucial because it will create an environmental impact on the global population and establish a better lifestyle for our community (Rahim & Jalal adeen, 2016). Byrka et al., (2017) claimed that regardless of people's attitudes to the environmental behaviour, personal expenses affect their acceptance about protecting the environment while income and educational level are fewer impacts to environmental behaviour. This disagrees with Ertz et al., (2016) who explored that the consumer who has more money and educational level tends to engage in environmental behaviour. Saikia (2017) also supported the work of Ertz that regardless of residential place, leading causes to affect environmental behaviour is people are not well informed in environmental protection. Hence, SM is one of the strategies needed to achieve practical environmental objectives and targets as it is imperative to raise public awareness of environmental problems (Saikia, 2017). Besides, results of the study on the influence of social networks on environmental awareness and the social responsibility in Brazil supported the work of Saikia that the person who received the information related to social responsibility and environmental sustainability has a positive influence on raising social and environmental awareness (Severo et al., 2019). Yildiz & Budur (2019) and Rahim & Jalal adeen (2016) also emphasise the role of social pressure on the student's environmental awareness as it can increase the more significant environmental behaviour. The social media has become a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness, but none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company. Therefore, it is necessary to ensure that the attitude about environmental awareness contributes to the engagement in social media, especially to value generation to the company. Since there have yet to be any literature studies regarding this topic, this study needs to be done to explore the role of students' environmental awareness to the value creation in SM. This research will explore how the customer's environmental attitude is

related to the engagement and creation of value to the company. Based on the existing knowledge of Gruss et al. (2020); Bruno Schivinski (2019); Vale & Fernandes (2018), value creation in SM in this research can be classified into low, medium, and high regarding consumption, contribution, and creation behaviour. The consumption, however, is a basis of engagement in social media, and it can lead to contribution and creation of value to the company later. In previous studies of environmental problems, measurements were made using a fundamental factor of attitude because environmental awareness is interpreted as a form of attitude to the environment (Ferguson et al., 1974; Ojiaku et al., 2018; Zubair & Chotib, 2020). It comprised of three main dimensions: cognitive, affective, and conative. Cognitive component means the process of creation of attitude based on their knowledge. Affective is an emotional element, which collects all emotions and feelings such as likes and dislikes, among others, and last components are conative, that constitute or behave concerning the expression of intention or behaviour. Therefore, these three components will be used as a measurement scale to evaluate the role of environmental awareness in this study. Therefore, the study hypothesised that:

- Hypotheses:
- 10 (a) Cognitive environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company
 - 10 (b) Affective environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company
 - 10 (c) Conative environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company
 - 11 (a) Cognitive environmental awareness moderates the relationship between customer's SM consumption and value creation to the company
 - 11 (b) Affective environmental awareness moderates the relationship between customer's SM consumption and value creation to the company
 - 11 (c) Conative environmental awareness moderates the relationship between customer's SM consumption and value creation to the company

3.4 Chapter summary

The key findings of this chapter are summarised in Table 3-1

Table 3-1 Summary of key findings in Theoretical development and hypotheses chapter

Conceptual framework
<p>This research applied the Theory of planned-behaviour and We-intention model as a basic knowledge of customer's engagement in social media. In bringing the engagement to value generation in social media, the author adapted the consumer's online brand-related activities (COBRA) which consist of consumption, contribution, and value creation. In this study, the author will set consumption as a fundamental activity of engagement in social media. In contrast, the higher activities, which are contribution and creation, will be set as a value to the company. Furthermore, for the environmental awareness perspective, this research will use the attitudinal of environmental awareness (cognitive, affective, and conative) as a measurement of environmental awareness on social media and value creation perspective.</p>
Hypotheses development
<p>The study hypothesised that:</p> <ol style="list-style-type: none">1 Social influence will have a positive and significant effect on customer-brand trust in SM2 Social presence will have a positive and significant effect on customer-brand trust in SM3 customer-brand trust in SM will have a positive and significant effect on the SM consumption4 customer-brand trust in SM will have a positive and significant effect on the value contribution to the company5 customer-brand trust in SM will have a positive and significant effect on the value creation to the company6 Social influence will have a positive and significant effect on the consumption in SM7 Reward will have a positive and significant effect on the consumption in SM8 SM consumption will have a positive and significant effect on the value contribution to the company9 SM consumption will have a positive and significant effect on the value creation to the company10 (a) Cognitive environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company10 (b) Affective environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company10 (c) Conative environmental awareness moderates the relationship between customer's SM consumption and value contribution to the company11 (a) Cognitive environmental awareness moderates the relationship between customer's SM consumption and value creation to the company11 (b) Affective environmental awareness moderates the relationship between customer's SM consumption and value creation to the company11 (c) Conative environmental awareness moderates the relationship between customer's SM consumption and value creation to the company

And the conceptual framework of this study is illustrated in Figure 3-2

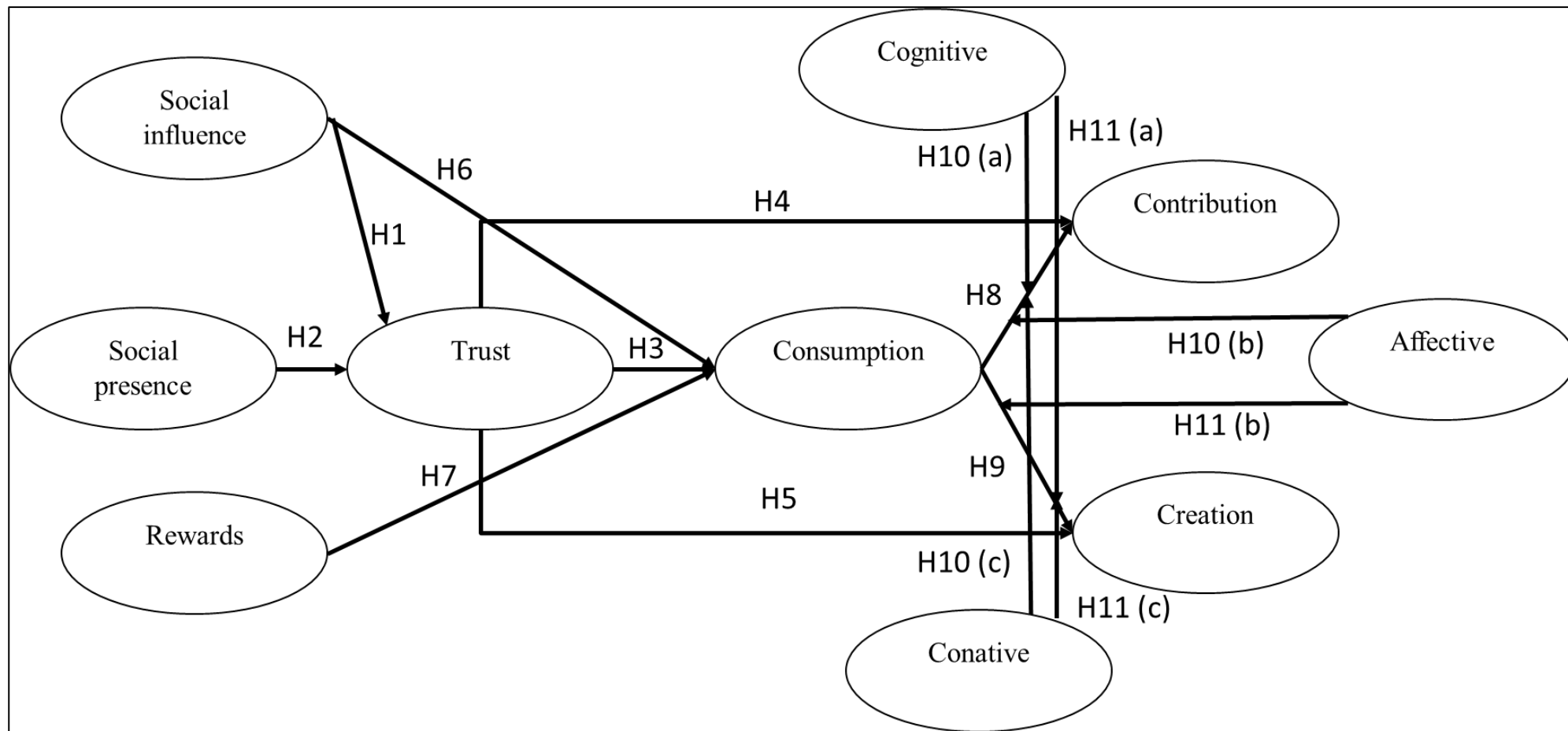


Figure 3-2 A conceptual model of this study

4 Research methodology

4.1 Chapter overview

This chapter outlines the methodological design of this study. It begins with the justification of the author's philosophical stance – positivism, and the chosen research approach – deductive, and then moves on to the detailed research design. Given that a quantitative research design is applied in this study, survey is chosen to be a data collection tools, and the design specifics comprise the constructs, and scale development, sampling strategy, data analysis and justification of validity and reliability of the model will be explained. Figure 4-1 illustrates the structure of this chapter.

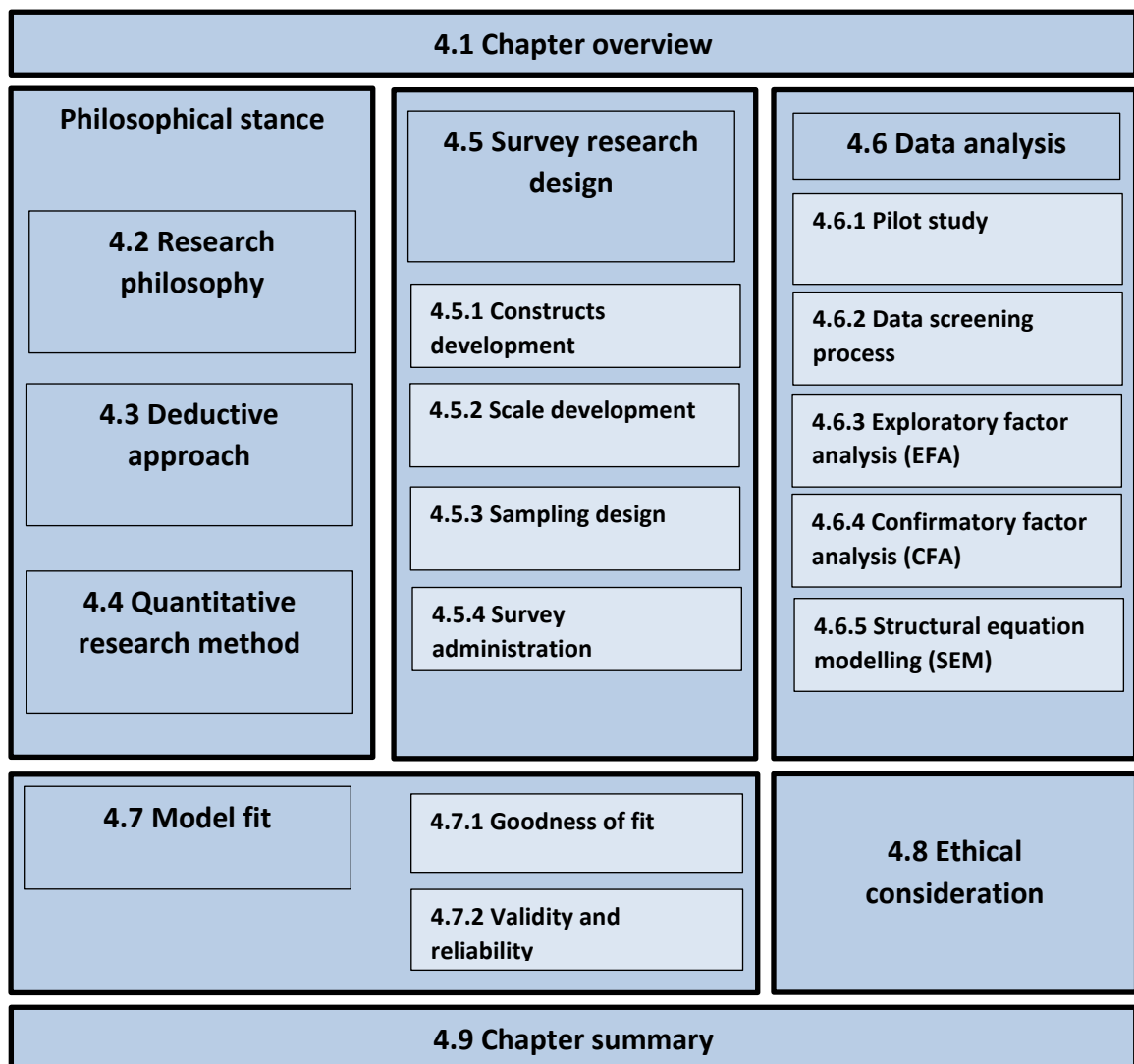


Figure 4-1 A structure of research methodology chapter

4.2 Research philosophy

The term research philosophy refers to a set of beliefs and assumptions of how researchers develop knowledge in their particular areas (Saunders et al., 2019). Without knowledge of research philosophy, there could be a failure in the research process, or effects on validity or reliability of the results, since this will have a significant influence on what the researchers are going to do and how they make any investigation through their understanding (Saunders et al., 2009). As a doctoral research study, therefore, it is necessary for the researchers to understand research philosophy fully and to define their philosophical stance to be in-line with their selected methods since the start of the project. Classifications of research philosophy are determined based on opinions of the researcher towards the nature of the world or the truth as nominalism or realism (ontology), ways to understand and explain the truth as interpretivism or positivism (epistemology), and tools or techniques that will be used in searching for the truth, for instance, ideographic and nomothetic (methodology) (Nanan et al., 2014).

Although there is an ongoing debate of the determination on which world-view is fit to the scholars (Creswell, 2014), this research will only focus on widely discussed philosophical research stances in most operation and management literature, namely positivism and interpretivism, which are explained and discussed in the section 4.2.1.

4.2.1 Positivism and Interpretivism

Research philosophy is divided broadly into two different categories, which are positivism and interpretivism. The first one is the group that holds on to realism, and sometimes is called systematic or scientific research, while the latter one is known as idealist or constructivism (Kumar, 2019). The basic concept of positivism is to view things on the planet as they all have a cause and origin, which can be explained by rules that exist in nature (Collis & Hussey, 2014). The roles of researchers, therefore, are to search for information according to what they want to study and to analyse data to explain the cause of existence through observation of objective facts. For example, to study the factors that influence success, researchers need to measure and collect data using empirical thinking such as observation or taking a laboratory experiment for the answer. Involvement and influence of researchers are considered as independent and value-free,

and the samples using in positivism philosophy are considered as large sample size and they tend to be concerned on hypothesis testing rather than generating a new theory (Fallon, 2016; Kumar, 2019; Nanan et al., 2014).

However, this does not mean that, as a positivist, it necessarily has to start with existing theory, the key important thing is a positivist researcher has to undertake research, as far as possible, in a value-free way with measurable, quantifiable and well-structured research method in order to facilitate replication (Saunders et al., 2019). It is, hence, assumed that most of the positivist researchers are taking a quantitative research method with a deductive approach in conducting their results.

In opposition to positivism, Interpretivism is the concept where knowledge or truth are obtained by using inductive reasoning (Collis & Hussey, 2014). Involvement and influence of researchers are considered as a part of what is observed and sometimes even actively collaborates, and the samples using in Interpretivism philosophy are considered as small sample size and they tend to be concerned on generating new knowledge (Fallon, 2016; Kumar, 2019; Nanan et al., 2014). Researchers recognise that their background determines their interpretation, and they situate themselves in the research as they understand how their interpretations are based on their personal experience, culture, and history (Creswell, 2014). This concept, therefore, is mostly associated with the qualitative method with the inductive approach, in which this kind of method relates to the generation of the meaning of data collected in fieldwork. A comparison of positivism and Interpretivism philosophies are summarised in Table 4-1, followed by the justification of philosophical stance.

Table 4-1 Comparison of research philosophy (Collis & Hussey, 2014).

		Positivism	Interpretivism
Basic principle	View of the world	The world is external and objective	The world is socially constructed and subjective
	Involvement of researcher	Independent	Researcher is part of what is observed and sometimes even actively collaborates
	Influence of researcher	Researcher is value-free	It is driven by human interests
Assumption	What is observed?	Objective, often quantitative fact	Subjective, by interpreting of meaning
	How to develop knowledge?	Reducing phenomena to simple elements representing general laws	Taking a broad and total view of phenomena to detect explanations beyond current knowledge
	Sample	Large	Small
	Theories and hypothesis	Concern with hypothesis testing	Concern with theory generating

Table 4-1 contrasts between positivism with interpretivism research philosophies. As a result, positivism is chosen to be the philosophical stance in this study for the following reasons;

i. Generalizability

Given that the original context of this study on Thai-undergraduate students who are familiar with social media, hence, the population of this study is very high. Adopting positivism philosophy, therefore, can achieve generalizability due to the sample relating in this kind of philosophy is accounted for as a large sample size. Additionally, the role of the positivist researcher is to explore observable and measurable facts with minimum involvement, which leads to the production of credible and meaningful data to be generalised to others context (Saunders et al., 2019). On the other hand, interpretivism is context-focused, in which the result

of the study is sometimes cannot be generalised to others context because the researcher influences the result (Walliman & Baiche, 2001).

ii. Objectivity

The objective of this study is to experiment or validate of theory rather than discover the meaning and consequences of participant's action. Thus, positivism is chosen due to it is related to objectivity such as quantitative fact.

iii. Deductively

Regarding the purpose of this study, it is more likely to be a hypothesis testing and modifying an existing theory rather than creating a new theory. Hence, a deductive approach, which is in-line with the positivism, is employed because it is a reasoning method that brings up basic knowledge which may be beliefs, agreements, rules, or definitions which are known before and accepted as accurate and lead to a conclusion (Kumar, 2019).

Considering these, the positivism philosophy is considered to be the chosen philosophical stance in this study. Given that this study is seeking to quantify the level of environmental awareness towards the relationship between antecedents of customer's participation and their value-creation to the company in social media, hence, the deductive research approach is employed to address the aim through the quantitative research method. The detailed design is presented in section 4.3.

4.3 Deductive approach

After deciding which philosophical stance that the author will rely on for this research, it will be followed by selecting the research approaches that can be classified into two types namely the deductive approach and the inductive approach (Nanan et al., 2014). Even if there is no practical way to identify the research approach to the different research philosophies, it is believed that the deductive is frequently used in positivism. At the same time, the inductive is useful in interpretivism (Kumar, 2019; Saunders et al., 2019). The main purpose is to explore causal relationships between concepts and variables (Saunders et al., 2009). The principle of deductive, therefore, must be explained and discussed in detailed.

A deductive is a form of inference based on prior knowledge or the universal truth to provide a conclusion that must be followed by the given reason. The cited reason or knowledge, therefore, must be valid and reliable (Collis & Hussey, 2014). It is because if the author claims an unreliable principle, it will lead to incorrect conclusions of the research. Furthermore, Blumberg et al. (2008) highlighted that deduction is often used to confirm existing knowledge rather than present new knowledge. The principle of deductive can be illustrated as in Figure 4-2.

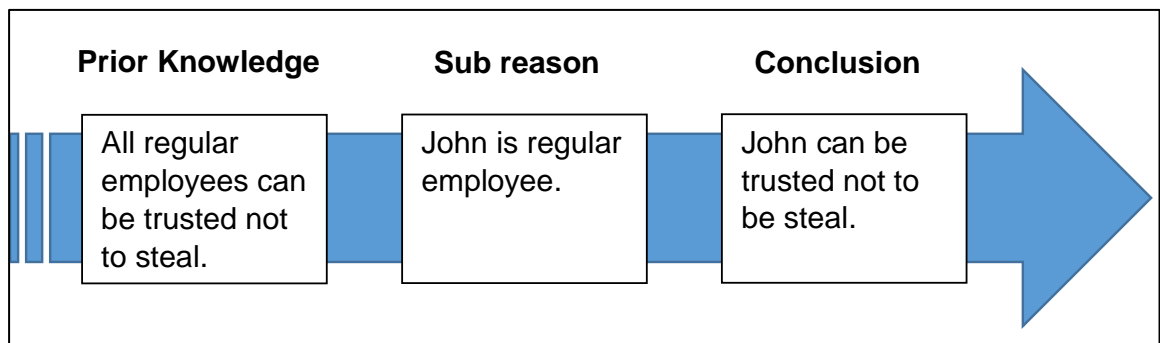


Figure 4-2 Example of deductive principle (modified from Blumberg et al., 2008).

From Figure 4-2, conclusion, which is John can be trusted not to be stolen, is a product of a sub-reason as John is a regular employee and it is under a prior knowledge or condition as all regular employees can be trusted not to steal. In summarize, a deductive method provides conclusiveness by the veracity of the truth of each evidence if each evidence is valid, and the dispute is correct (Kumar, 2019). On the negative side, a conclusion can be false if one or more sub-reason is incorrect or if different assumptions are used, then the conclusion to be concluded from this will be incorrect (Saunders et al., 2019). As highlighted by Blumberg et al.(2008), a deductive research approach is related to quantitative research methods. Hence, a choice and selection of the quantitative research method will explain in section 4.4.

4.4 Quantitative research method

Quantitative research is a method of searching for knowledge and truth, with an emphasis on quantitative data (Saunders et al., 2009). The objective is to explain scientific phenomena by the use of a statistical presentation such as percentage of the population living in the city, the average and the standard deviation of satisfaction (Nanan et al.,

2014). Types of quantitative research can be broadly divided into two groups, and the first one is the actual experiment which explores whether a specific treatment influences an outcome, including less rigorous experiments called quasi-experiments which is similar to experimental research but lacks random assignment (Creswell, 2014). The last one surveys. Survey research is a collection of data from a selection sample through their response to the given question (Nanan et al., 2014). The summarize of the quantitative research method is illustrated in Figure 4-3

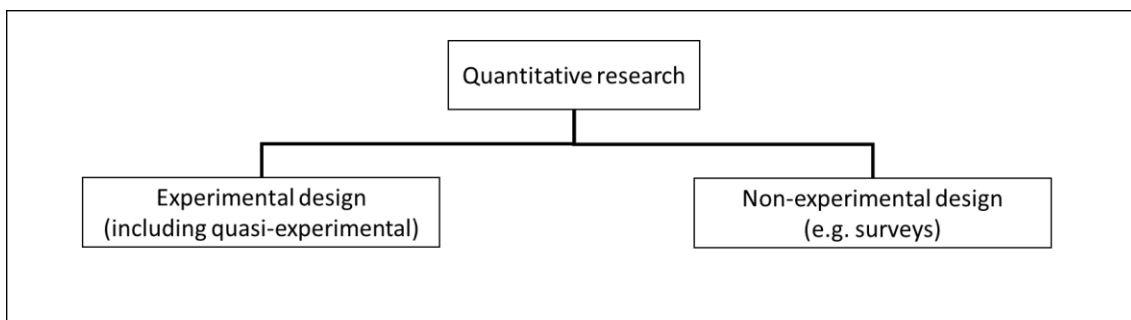


Figure 4-3 Quantitative research design (adapted from Creswell, 2014).

In this study, conducting a survey is chosen to be the selected strategy. This is because, the objective of this study is to explore the relationship between environmental awareness onto the value creation to the company on social media of customer, which a population as a customer to be in this scope of the study is high. Hence, a survey is suitable as it can provide a high level of general capability in representing a large population with low operation costs at a convenience data gathering process (Creswell, 2014; Fallon, 2016; Saunders et al., 2009; Walliman & Baiche, 2001). Moreover, data collected using a survey strategy allows the researcher to employ descriptive and inferential statistics in order to interpret relationships between variables and to produce models of these relationships (Saunders et al., 2019).

In survey research, data can be collected in a variety of ways, and it can be classified into two main types, which are primary and secondary data. The main methods for collecting primary data is interview and questionnaire, while the secondary data is used of existing resources such as the government publications, personal records, and databases (Blumberg et al., 2008). For the interview, it can be divided into three forms: unstructured, semi-structured, and a structured interview, and method of interview is conducted via telephone, face-to-face, or web-based resource (Collis & Hussey, 2014). While, for the questionnaire, it can be done through telephone, online questionnaire

web-based, self-administered, or by post or e-mail (Blumberg et al., 2008). Each method has benefits and its disadvantages compared to others. Hence, a comparison between methods will be illustrated in Table 4-2, in which “1” implies the highest benefits on this factor, while “4” represents the lowest strength.

Table 4-2 A comparison between data collection method (adapted from Forza, 2016; Miller & Salkind, 2012).

Factors influencing	Mailed	Face-to-face survey	Telephone survey	Web-based survey
Lowest relative cost	2	4	3	1
Highest response rate	4	1	2	3
Higher accuracy of information	2	1	4	3
Largest sample coverage	1	4	3	2
Completeness, including sensitive materials	3	1	2	4
Overall reliability and validity	2	1	3	4
Time required to secure information	4	2	1	3
Ease of securing information	1	4	3	2

As shown in Table 4-2, a self-administered survey offers the highest response rate compared to other methods. Hence, a face-to-face survey will be selected to be the primary method as a sample size required for this study is high since the population of this study is large (See section 4.5.3). Besides, a self-administered survey maximizes the completeness of data, including making the most of overall reliability and validity of data. This may be concerning the ability of respondents to clarify complex questions to the respondents. Details of survey research design will be clarified in section 4.5

4.5 Survey research design

In this section, it will explain some sequences to be followed in a survey research method. They were starting from developing a conceptual model by describing how the constructs have emerged. Followed by measurement development by deciding types and number of scales to be used in this study.

4.5.1 Constructs development

In the literature review chapter, it identified four different customer characteristics that involved with a consumers-brand relationship in social media, three different level of engagement in social media, and three environmental awareness dimensions toward its relationship between customers characteristics and level of engagement in social media.

For the customer characteristics dimensions, this research adopted the measures from existing literature from the works of Chan, Zheng, Cheung, Lee, & Lee, (2014), Wang & Abdullayeva, (2017), Pratono, (2018), and Cheung, Chiu, & Lee, (2011) and models as an variable to four different constructs, i.e. reward, customer-brand trust, social influence, and social presence.

Firstly, the definition of reward is explained as a thing given in recognition of one's service, effort, or achievement (Song & Yoo, 2016; Hamilton et al., 2016). In terms of rewards of using social media, this research will follow the classification of rewards based on the beneficial values which are purposive value, self-discovery, social enhancement, maintaining interpersonal interconnectivity, and entertainment. In which a purposive value is obtained from the achievement of the objectives of the data and predefined tools, self-discovery is to find your own perspective through social interactions, maintaining interpersonal relationships means the social benefits that are gained from establishing and maintaining contact with others (Cheung et al., 2011; Gefen & Straub, 2004). In addition, social enhancement refers to the value that a participant derives from the acceptance and approval of other members and the improvement of the social status of one within the community due to its support, and entertainment value refers to fun and relaxation through playing or interacting with others (Chan et al., 2014; De Oliveira & Huertas, 2015; Zheng et al., 2018). As of literature review showing that higher rewards reflect higher satisfaction, increase excessive consumer awareness, and the

attractiveness of brand relationships, thereby increasing the customer's willingness to continue to contact to the brand. Therefore, for the reward, researcher developed 5 reward measurement items based on the study of Song & Yoo, (2016) and Hamilton et al. (2016), which cover of financial benefits, which is divided into monetary and nonmonetary rewards, psychological, functional, and social rewards in which it can cover all types of rewards of using social media defined in this research.

Secondly, the definition of customer-brand trust is founded to be a significant impact on the participation in social media (Gefen et al., 2005; McLaughlin & Stephens, 2019). Customer-brand trust is defined as perspectives on the rationale for brand dependence as capacity and the willingness to fulfil the contract with the consumer (Dalziel et al., 2011). While, Delgado-ballester et al. (2001) highlighted customer- brand trust as a state of a sense of security while interacting with a brand, based on the perception that the brand will remain credible and accountable for customer satisfaction. In addition, George (2004) examined the relationship between trustworthiness in SM including beliefs about perceiving behavioural control, and the expectations of other important people and online buying habits and data indicated that trustworthiness have a positive effect on buying behaviour. This is to confirm the chain of effects from brand trust can affect to brand performance (Gefen et al., 2005). In this study, customer-brand trust refers as “the willingness of an average consumer to rely on the ability of the brand to perform its stated function” (Chaudhuri & Holbrook, 2001), which cover all dimensions of trust proposed by Shin et al. (2019) including brand credibility and brand integrity. For brand credibility refers to the ability of the brand to meet the prevailing conditions compared to expected performance, while, brand integrity refers as a recognition as an integral part of consumer’s everyday life and is essential to product identification. These customer-brand trust can then create brand commitment, brand loyalty, and brand reputation (Shin et al., 2019). This research adopted the 5 measurement items of customer-brand trust from the study of Wang & Abdullayeva (2011) as it can covers all dimensions of customer-brand trust defined in this study and the relation to brand commitment, brand loyalty and brand reputation.

Social influence is a change in behaviour that one person causes on another, intentionally or unintentionally, as a result of the way the transforming person sees himself in relation to other influencers and society in general (Dholakia et al., 2004). Social influence defines

changes in attitudes and actions produced by social influence, which can occur at different "levels" which different levels of change correspond to differences in processes in which individuals accept their influence (Kelman, 1958). Cheung et al. (2011) identified level of attitude change due to social influence into 3 levels based on the subjective norms, group norms, and social identity. Hence, for the social influence in this study, it applied the study of N. Wang & Sun (2016), Cheung et al. (2011), De Oliveira & Huertas (2015) A. X. Shen et al., 2010; K. Wang et al., 2018) as it was combined the subjective norms; which is the recognising social pressures to engage or not to engage, group norms; which is to share and refer to the general self-introduction guide to achieve goals and share them with a group of people, and social identity, which is to define their position in the network of people (De Oliveira & Huertas, 2015; A. X. L. Shen et al., 2009; Zhao et al., 2018). And this study will modify the social influence measurement items from Dholakia et al. (2004) as it contains of subjective norms, group norms, and social identity of social influence.

Social presence refers to the degree at which a person perceives the presence of a participant in communication (Gefen & Straub, 2004). In others word, it is defined as the feeling of being present in a meeting with another person, this can be seen when connecting with others in social situations because it creates social status and even interpersonal contact (A. X. L. Shen, Lee, et al., 2011). In this study, definition of social presence is followed a study of Calefato et al. (2015) and Dholakia et al. (2004) as it refers to the personal experience of being with a "real" person and reaching out to his or her thoughts and emotions through social media platform and the measurement items are adapted from the study of Cheung et al. (2011), which is developed from the study of Gefen and Straub (2004) as it is developed based on user's perception and the attributes of social media . In conclusion, measurement items regarding of customer characteristics dimensions will be illustrated in Table 4-3

Table 4-3 Measurement items regarding of customer characteristics dimensions

Construct	Details of questions	References
Rewards	<ol style="list-style-type: none"> 1. Direct monetary rewards are expected for active participation in brand social media 2. Indirect monetary rewards are expected for active participation in brand social media 3. Psychological rewards are expected for active participation in brand social media 4. Functional rewards are expected for active participation in brand social media 5. Social rewards are expected for active participation in brand social media 	Song & Yoo, (2016) and Hamilton et al. (2016),
Trust	<ol style="list-style-type: none"> 1. I trust the information shared with me by people I know through social media channels 2. Companies who are well known in social media are credible 3. I feel a sense of loyalty with companies I know via social media using 4. I trust the data generated by the company more than the data provided by individual 5. I worry about how the company will use my data provided on social media in a harmful way 	Wang & Abdullayeva (2011).
Social influence	<ol style="list-style-type: none"> 1. Group of people who influence my behaviours would think that I should use Facebook 2. Group of people who are important to me would think that I should use Facebook 3. How attached are you to the group you mentioned above? 4. I am a valuable member of the group that I mentioned above 5. I am an important member of the group that I mentioned above 	Dholakia et al. (2004)
Social presence	<ol style="list-style-type: none"> 1. There is a sense of human contact in Facebook 2. There is a sense of personness in Facebook 3. There is a sense of sociability in Facebook 4. There is a sense of human warmth in Facebook 5. There is a sense of human sensitivity in Facebook 	(Cheung et al., 2011)

Environmental issues are important to all stakeholders in the whole supply chain including manufacturers, service providers, consumers, and government agencies. All activities in the supply chain have great impacts on the environment. The consumption culture of consumers in the twentieth century has caused environmental degradation and adverse effects on health and ecosystems. Despite these concerns, consumers are still unable to purchase environmentally friendly or green products due to lack of awareness and beliefs about the benefits of environmental thinking (Ojiaku et al., 2018). In the study of environmental awareness in social media, most of the study apply a revised of New Ecological Paradigm (NEP) scale in measuring of endorsement of a “pro-ecological” behaviour (Hynes & Wilson, 2016; Ogunbode, 2013; Srbinovski et al., 2020). However, this scale has a disadvantage in applying to justify the attitudinal phase of environmental awareness because it combines all element into one main set of questions which hard to distinguish between the dimensional of environmental attitude. Generally, the attitudinal of environmental awareness comprises of three dimensions; cognitive, affective, and conative (Gifford & Sussman, 2012). Cognitive environmental awareness is related to the environmental knowledge, affective environmental awareness is involved with the emotional attitude, and conative environmental refers to the connection of knowledge and affect to behaviour and is associated with the issue of "why." (Ferguson et al., 1974; Zubair & Chotib, 2020). The measurement of environmental awareness in this research, therefore, will apply a revised scale for the measurement of environmental attitudes and knowledge, which is firstly proposed by Maloney (1975) as a primary measurement scale to justify an attitudinal of environmental awareness because they classified the scale into different groups based on their different dimension of attitudinal environmental awareness. In addition, for the cognitive environmental awareness, this research applied the work of Mei et al. (2016); Yin & Law (2019); and Zheng et al. (2018) as it extended the work of Maloney into a study on Asian customer which is expected to be the similar in cultural perspective to Thai. Measurement items regarding of environmental awareness dimensions will be illustrated in Table 4-4

Table 4-4 Measurement items regarding of environmental awareness dimensions

Construct	Details of questions	References
Cognitive environmental awareness	<ol style="list-style-type: none"> 1. Destruction of forests will cause biological imbalances 2. Alternative energy, e.g. solar energy can be utilized in place of electricity 3. Unleaded petrol is better than leaded petrol as it is less harmful to the environment 4. Using public transport can help alleviate air pollution 5. Should not promote the use of disposable items only because of convenience to consumers 	Mei et al. (2016); Yin & Law (2019); and Zheng et al. (2018)
Affective environmental awareness	<ol style="list-style-type: none"> 1. It frightens me to think that much of the food I eat is contaminated with pesticides. 2. It genuinely infuriates me to think that the government does not do more to help control pollution of the environment. 3. I become incensed when I think about the harm being done to plant and animal life by pollution. 4. When I think of the ways industries are polluting, I get frustrated and angry. 5. I am bothered by so-called "noise pollution." 	Maloney (1975)
Conative environmental awareness	<ol style="list-style-type: none"> 1. I would be willing to ride a bicycle or take the bus to work to reduce air pollution. 2. I would be willing to use a rapid transit system to help reduce air pollution. 3. I would donate a day's pay to a foundation to help improve the environment. 4. I would be willing to stop buying products from companies guilty of polluting the environment, even though it might be inconvenient 5. I am happy to write to authorities' members every week about environmental issues. 	Maloney (1975)

Value creation often refers to the value created for users or companies. Bechmann & Lomborg (2013) described many ways that companies can benefit and create value from user participation in SM, including (a) through the networking, status updates, and content contribution ; (b) by participating in company development and innovation and (c) by selling information obtained from users' digital data profiles. This is supported that user profiling can create value for the company (Bechmann & Lomborg, 2013). Shao (2009) differentiates between the levels and types of consumer's engagement with brands on social media by proposing the consumer's online brand-related activities (COBRA) framework. The COBRA framework is a behavioural structure that covers

consumer activities related to brand-related content on social media. Considering the increasing role of branding and brand communication on social media, researchers and practitioners need to have measurement tools that cover activities related to various social media brands engagement from a consumer's perspective (Baumöl et al., 2016; Muntinga et al., 2011). Value generation in SM in this research can be classified into low, medium, and high regarding consumption, contribution, and creation behaviour (Voorveld et al., 2018; Damron, 2017). The consumption level, however, is a basis of engagement in social media, and it can lead to contribution and creation of value to the company later. The example of value consumption level in social media such as viewing, following, and reading contents provided by company on SM platform, the example of value contribution level such as commenting and rating contents provided by company on SM platform, while for the example of value creation level such as create a review or publishing company-related contents on SM platform (Shao, 2009). Measurement items regarding to value generation to the company will be illustrated in Table 4-5

Table 4-5 Measurement items regarding to value generation to the company

Construct	Details of questions	References
Consumption	1. I read post related to brand on social media 2. I read fan pages related to brand on social media sites 3. I watch picture/graphics related to brand 4. I follow videos related to brand 5. I follow official Facebook fan pages relate to brand on social network sites	Schivinski, et al. (2016)
Contribution	1. I comment on videos related to brand on social network sites 2. I comment on posts related to brand on social network sites 3. I comment on picture/graphics related to brand on social network sites 4. I shared brand X related to brand on social network sites 5. I like posts related to brand on social network sites	Schivinski, et al. (2016)
Creation	1. I initiate posts related to brand on my personal Facebook 2. I post picture/graphics related to brand on social media 3. I write reviews related to brand on social media 4. I write posts related to Brand on Facebook page 5. I post videos that show brand on social media	Schivinski, et al. (2016)

4.5.2 Scale development

The measuring scale is an assignment of numbers to things that need to be studied under specific rules. The analyser needs to know the characteristics of the data being measured, in order that it will be used in determining which statistical methods would be suitable (Kumar, 2019). As highlighted by Hair et al. (2014), the choice of measurement scale will have an impact on the determination of appropriate data analysis techniques. Therefore, it should be known which types of scale are used when measuring data. Generally, the measurement scale is divided into four types (Hair et al., 2014):

1. **Nominal scale:** There is no quantitative meaning on this scale. The number indicates specific attributes or characteristics, such as gender or occupation. This scale is also known as categorical scale.
2. **Ordinal scale:** It is a scale used for ranking or position of things that need to be measured. The numbers in this level of measurement indicate the meaning in relative aspect, for example, more-less, high-low, agree-disagree. However, different rank numbers cannot indicate the amount of difference; for example, it cannot quantify the amount of difference between the first and second pageant award.
3. **Interval scale:** It is a scale where numbers are assigned with equal spacing between numbers. The difference between each scale, therefore, can be compared; however, the ratio between these two scales cannot be defined as it does not have true zero in this scale. For example, even if Mr Pichai get 0 points in the exam, it does not mean that he does not know at all.
4. **Ratio scale:** It is the highest measurement level meaning that apart from being able to be grouped, ranked, and equally spaced, it is also has a starting point at fixed zero, and it can be used for mathematical operation such as measurement of weight, height, distance, income (Kumar, 2019).

In this study, Likert scales, which is accounted as an ordinal scale, is applied to be the measurement scale. Likert scale is one of the summated ranking scales developed by Rensis Likert (Jituea & Pasunon, 2018). This is because the Likert scale can be used to measure the respondent's attitude by measuring the extent to which they agree or disagree with a specific question. Furthermore, this study aims to measure the

fundamental beliefs of social media, their environmental attitudes, and their opinions towards value creation to the company in SM; hence, the use of a Likert scale is suitable.

In current practice, most rating scales, including Likert-type scales and other attitude and opinion measures, contain either five or seven response categories. Symonds (1924) was the first one who suggested that the reliability could be optimized with seven response scales, and other early investigations tended to agree (Colman et al., 1997). It has been argued that the human mind has a range of complete decisions that can distinguish about seven different types, as an instant memory can range for about seven items. Hence, increasing the number of response categories beyond seven may be useless (Colman et al., 1997; Preston & Colman, 2000). It was found that seven-point Likert scales generated strong relationships with t-test results, and appeared to be more suited to electronic distribution of usability inventories (Finstad, 2010; Lewis, 1993).

In conclusion, seven-point Likert scales are selected to be used in this study. The scale is ranked between 1 (strongly disagree to the given statement) to 7 (strongly agree to the given statement).

4.5.3 Sampling design

This section describes recruitment sampling process, starting from defining a target population, followed by calculation of sample size, and justification of sample selection procedure.

4.5.3.1 Target population

As the objective of this study is to focus on exploring the relationship between customers's environmental awareness and their value creation using social media, hence, ages, traditional, and educational level would influence this relationship. To control this, the population in this study is focused on a Thai-undergraduate student. Hence, the target population are Thai undergraduate student which have around 1.6 million (National Statistical Office in Thailand, 2020).

4.5.3.2 Sample size

One important thing of determining a suitable sample size is that it impacts on statistical power. To understand statistical power, it must first identify the acceptable level of statistical error or sampling error. Generally, there are two types of error, which are **Type**

I error, or alpha (α), in which a type I error is the rejection of a correct null hypothesis and **Type II error**, or beta (β), is the non-rejection of a false null hypothesis (Hair et al., 2014). The summary of statistical error is illustrated in Table 4-6

Table 4-6 Statistical error (Hair et al., 2014).

		Reality	
		No difference	Difference
Statistical decision	H_0 : No differences	$1-\alpha$	β (Type II error)
	H_0 : Differences	α (Type I error)	$1-\beta$ (Power)

To calculate a sample size, many authors suggested setting the confidence interval ($1-\alpha$) at 95%. The confidence level is the probability that the margin of error contains the exact proportion. If the study was repeated and the range calculated each time, it would expect the correct value to lie within these ranges on 95% of occasions (Wolf et al., 2013). In this study, it will be using a two-tailed test because the study aims to test for the possibility of the relationship regardless of the direction of the relationship. The formula to calculated sample size is illustrated in Formula 1 (Fadlelmula, 2011; MacCallum et al., 1999).

$$\frac{\{(Z_{\alpha/2})^2 * \sigma * (1 - \sigma)\}}{e^2} \quad (1)$$

Where; $Z_{\alpha/2}$ is a Z-score regarding to the selected confidence interval

σ is a standard deviation

e is a margin of error

Most studies recommended to choose a 95% confidence level, .5 standard deviation, and a margin of error (confidence interval) of +/- 5% (MacCallum et al., 1999; Wolf et al., 2013), and the Z value at 95% of the confidence interval is 1.96. The Formula (1) selected the Z score, margin of error, and confidence interval level, it can calculate the recommended sample size for this study at 384 samples.

4.5.3.3 Sample selection procedure

When doing research about a group of people, it is impossible to gather information from everyone in that group. Hence, it is recommended to choose samples instead. A sample group is a group of people who will participate in the research (MacCallum et al., 1999).

To draw accurate conclusions from the results, the researcher needs to make a careful decision about choosing samples that represent the overall group. Generally, there are two types of sampling methods (Kumar, 2019; Sudman et al., 1993):

1. Probability sampling involves random selection, allowing researchers to make statistical inferences about all groups.
2. Non-probability sampling involves non-random selection based on convenience or other criteria, which allow researchers to gather initial data quickly.

Probability sampling means that all members of a group are likely to be chosen. It is mostly used in quantitative research. It is highlighted that if the researcher wants to produce results that represent the entire population, they must use probability sampling techniques (Hair et al., 2014; Kumar, 2019). Therefore, the author will choose the probability sampling as a sampling technique for this research to generalize the result and ensure the validity and reliability of generated results. There is 4 primary probability sampling method which are:

1. *Simple random sampling*

In a simple sampling, every member of the population has an equal chance of being chosen. Hence, a sample frame should have the entire population.

To do this type of sampling, it can use tools such as random number generators or other techniques based on all opportunities.

2. *Systematic sampling*

Systematic sampling is similar to simple sampling but is generally a bit easier. Every member of the population is identified by numbers. However, instead of generating random numbers, people are chosen at regular intervals.

3. *Stratified sampling*

This sampling method is appropriate when the population has mixed characteristics, and the researcher wants to make sure that all the characteristics are proportional in the sample.

To do this, the researcher needs to divide the population into subgroups according to the relevant characteristics (such as gender, age range, parentheses, income, and job role). Based on the overall proportion of the population, the researcher needs to calculate how many people should be sampled from each sub-group. The researcher then uses random or systematic random sampling to select samples from each subgroup.

4. *Cluster sampling*

Cluster sampling also involves dividing the population into subgroups. However, each subgroup should look similar to all samples. Instead of randomly sampling people from each sub-group, the researcher then randomly selects all the sub-groups.

The researcher might include everyone from the selected cluster to be a sample. However, if the group itself is still large, the researcher can sample individuals from within each cluster using one of the techniques above.

Many authors recommended that cluster method is a right way for dealing with large populations (Creswell, 2014; Kumar, 2019; Miller & Salkind, 2012), which this case is approximately 1.6 million, However, there is a higher risk of error in the sample because there may be significant differences between groups as It is difficult to guarantee that the sample group truly represents the entire population.

To overcome this bias, the researcher classified the population into stratum based on the information provided by the office of the higher education commission (OHEC) in Thailand (OHEC, 2020). Generally, the university in Thailand can be classified into large and small university based on the number of enrolments of a full-time student. A large university in their given definition is a university which has registered students over 20,000 in one academic year. In contrast, a small university is a university which has enrolled students below 20,000. With the estimated required sample size at 384, the

author decided to double up to be 800 as the author needs to ensure that the number of returned questionnaires are high enough for the data analysis process. To do this, the author decided to select 8 University and choose 100 samples per university as a representative of each university. The used of cluster sampling technique with the stratum and simple and systematic random technique is to ensure that sample in this survey can cover all types of population and a university student can be used to be a representative of population as they are selected randomly from different in terms of size of university from large to small, location of university from north to south, different area of study that cover all area of study, and different ages, gender, religion, which can reflect the real situation of the whole population of Thai people which can be classified into one of these stratum. This evidence is proving that the university student can appropriate to be used as a representative for the whole adolescence population of Thailand.

Hence, 4 university from a large university, and 4 university from a small university will be selected randomly through a simple random technique. The result comprises of Thammasat University (TU), Mahidol University (MU), Prince of Songkla University (PSU), and Suan Sunandha Rajabhat University (SSRU) as a representative for the large university, and Thaksin University (TSU), Rajamangala University of Technology Srivijaya (RMUSV), Walailak University (WU), and Mahasarakham University (MSU) for the small university.

100 samples per institution are recruited using a systematic random sampling technique based on the database of student number in each university. In total, 800 paper-based questionnaires were delivered to the respondent, with the total return at 746, accounted in 93.25 percent of response rate. In conclusion, the sample selection procedure is illustrated in Figure 4-4

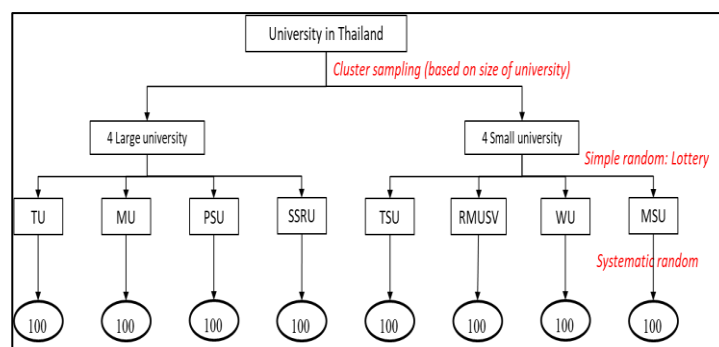


Figure 4-4 A sample selection procedure of this study

4.5.4 Survey administration

This section describes how to handle surveys to increase the maximum response rate together with explicating method that is used to reduce response errors.

4.5.4.1 Contact methods

After deciding the number of samples, and how to choose these samples in this survey, the author, then, contacted to the office of educational affairs under the Thai government United Kingdom (Appendix A) because they can provide a list of e-mails of contacting persons for each selected institutes in the sampling design stage. The researcher, firstly, contacted to those people, with the explanation of research objectives, data collection frame and process, along with an ethical consideration to obtain a list of student number and their contacting information. The researcher also sent a letter asking for permission to use the information and collect data from the selected universities (Appendix B) with attached of ethical approval certification (Appendix C). After that, the researcher got a permission letter which is shown in (Appendix D). For the data collection procedure, the researcher followed the study of Greenlaw & Brown-Welty (2009) by using a mixed-mode of the survey, which is the combination of the web-based and paper-based survey. The first one was employed during the pilot study, and the latter was applied to the final survey process. The main reason of doing a web-based survey in the pilot study stage is to reduce time and cost of the study, including reducing a geographical problem due to the survey location is in Thailand (Saunders et al., 2019). In this stage, questionnaires were sent to participants via e-mail together with a participant information sheet (Appendix E) and consent form (Appendix F). Within the e-mail, the researcher briefly provided some information on how to complete a survey for those who are unfamiliar with online web-based software, namely Qualtrics, and a link to the survey. Qualtrics is an online survey which can be used in both PCs and mobile web-based (www.qualtrics.com). It has a capability for respondents to stop in mid-survey and resume later where they left off, also, allows the researcher to check who is opted out and they can be classified as a non-willing to complete the survey, in order to be ease for the future communication. After the first e-mail was sent out in one week, two reminder e-mails were followed to boost the response rates. The response record for the online web-based survey in the pilot study stage are shown in Table 4-7

Table 4-7 Survey response record

Correspondence	Total contact	Number of responses	Response rate
Initial e-mail	200	22	11%
1 st round follow-up	178 (200-22)	13	7.3%
2 nd round follow-up	165 (178-13)	8	4.8%

From the above table, the highest response rate occurred in the first e-mail address, with a continuously reduced in the first and second followed-up e-mail. In total, the number of responses is 43 out of 200 of total contact, which is calculated into the response rate of an online web-based survey for 21.5 percent. This is comparable to a similar study in operation and management study which employed an online web-based survey, for instance, de Giovanni (2012): 17.1%, and Zhang (2018): 17.7%.

In the final survey stage, a paper-based method was employed. The Reasons of doing a paper-based method survey are to mitigate sampling errors of doing a purely web-based survey for those who do not have to provide their contact e-mail address or those who have limited access on web capacity, moreover, measurement error from poor instrument design, such as poor wording in the questionnaire or a non-user-friendly platform, and format and layout of web-based questionnaires lead to missed questions, additionally to reduce coverage errors of an unopened e-mail, or e-mail was sent to a spam folder, and the most important reason is to moderate non-response errors by increasing the level of response rates through the follow-up of the researcher to collect the questionnaire in person. This is because the population for this research is very high. Hence, it requires a higher number of samples to represent the whole population. In the paper-based survey, questionnaires were distributed to the selected samples through the help of each university staff representatives, and the questionnaires will then be collected by the researcher in person. The data were collected from June to September 2019. The disadvantages of doing this method is a higher cost and time consuming compared to a solely web-based, or a mail survey (Richardson et al., 1995), also, the researcher needs to be in the location which is, sometimes, concern with the safety issue. Even if the author is trying to mitigate all the possible errors from the web-based survey,

there are still some error occur in the paper-based survey. Table 4-8 summarises types of error which will affect the result in this survey and how to mitigate these errors

Table 4-8 Survey error (adapted from Sudman et al., 1993).

Error type	Definition	Affect to the result	Error mitigation	See more
Sampling error	The degree of missing eligible individuals who are not able to be sampled during the study	Create bias and it will have an impact on statistical power	The likely size of the sampling error can generally be controlled by taking a large enough random samples from the population	See section 4.5.3.2
Measurement error	The degree to which imperfections or lack of clarity in the measurement tool cause errors in measurement	Construction and questionnaire design lead to incomplete coverage and varied interpretations by different enumerators leading to inaccuracies in the collected data	Careful formatting of paper surveys to direct participants' attention to clearly worded items, defined response options, and flow of survey pages; Pilot testing of all surveys	See section 4.6.1
Coverage error	The degree to which a survey statistic differs from the true value because the sample frame does not cover the population	Frame imperfections can bias the estimates in the following ways: If units are not represented in the frame but should have been part of the frame, this results in zero probability of selection for those units omitted from the frame.	One way to reduce coverage error is to rely on multiple sources to either build a sample frame or to solicit information. This is called a mixed-mode approach.	See section 4.5.3.3
Non-response error	The number of accessed members of a population who do not respond or complete the survey	The higher the number of errors, the less reliable the information. When non-sampling errors occur, the rate of bias in a study or survey goes up.	Collect the questionnaire in person, and use missing data analysis process	See section 4.6.2.1

4.6 Data analysis

Using the empirical data, the Sreejesh & Mohapatra, (2013) two-step approach was followed because of two main reasons; firstly the two-step approach is suitable for analysis of model that attempt to test new theories (Jituea & Pasunon, 2018). In which for this study, constructs are developed from existing literature from another context of study such as country, ages, etc., For this two-step approach, the measurement model will be tested first to test the calibration of the construct. The validation of the structural measurement model is then being tested to check a verification of model feasibility and its generalizability (Kline, 2011). Secondly, this research is in the same area of study that is in the customers-brand relationship. The first step of the study comprises of two main sub-steps, including pilot study during the online-survey phase and construct calibration using exploratory factor analysis (EFA). While the second steps, including a measurement model validation using a confirmatory factor analysis (CFA) and structural model validation through statistical programs of analysis of moment structures (AMOS). Data to be analysed come from the final paper-based survey phased. In this final paper-based survey, there are 746 responses out of 800 total contacts, and after it went through the data screening process in Chapter 5, the number of response data to be analysed is 708. This data was divided into two groups. The first one was used in the first step of analysis; hence, 250 response were selected randomly by a systematic sampling technique. The reason for selecting this amount of responses are based on the study of Wolf et al. (2013) who mentioned that a suitable number of sample belongs to how complex the model is, and what statistical power to be used in factor analysis. In principle, Hair et al. (2014) suggested a rule of thumb at the number of samples are ten observations per estimated variables, and in this case, the number of expected variables is 10; therefore, the minimum number of responses in factor analysis are 100. However, Guilford (1954) suggested that the minimum of sample size in factor analysis should be 200, while the recommendation size of sample by Cattell (1979) is 3-6 observations per items, with a minimum size of 250, and in this study, it has 50 items. Hence, the selected sample size for the first step of analysis is 250. This is in line with the study of MacCallum et al. (1999) that larger samples tend to produce more accurate solutions. The majority of samples, therefore, is used for model validation in the second step. The second step of this study

is model validation using CFA and structural equation modelling (SEM). In this step, the rest of the sample size, which are 458 cases were analysed by SEM in AMOS version 26. This is followed the recommendation of a sample size to be used in an SEM application which can be classified into three levels: small (<100), medium (100-200) and large (>200) (Kline, 2011) and it is common that a large sample is necessary to test a complex model (MacCallum et al., 1999). Furthermore, this sample size is larger than the calculated sample size at 384 in section 4.5.3.2. In conclusion, the analysis procedure is illustrated in Figure 4-5

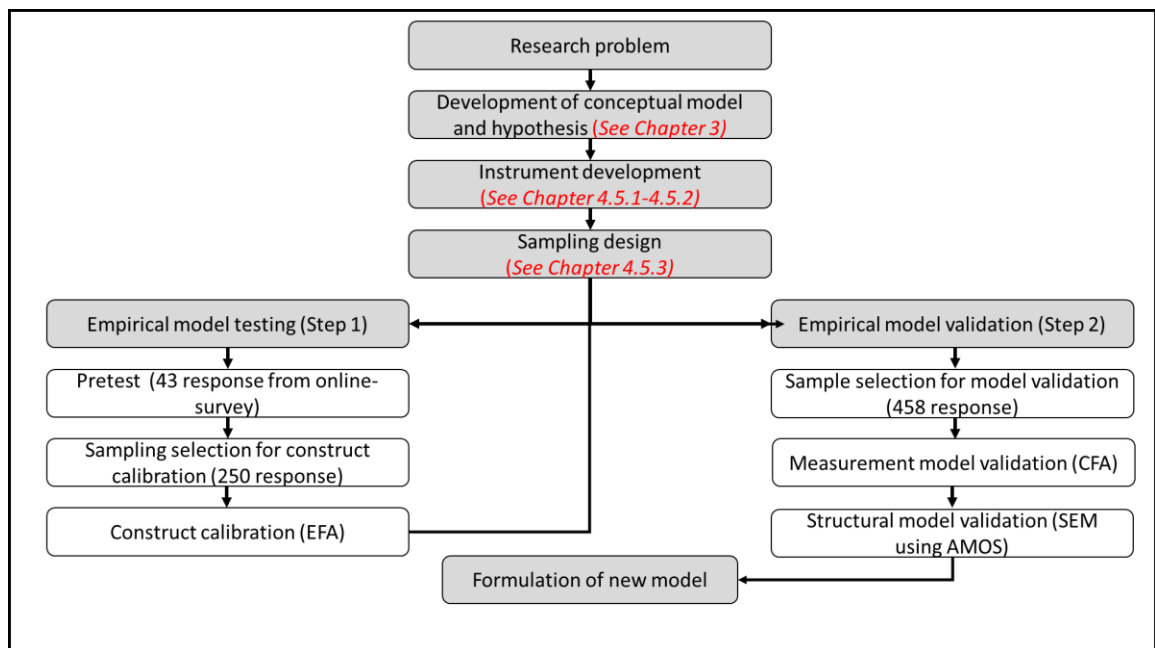


Figure 4-5 Two-step approach of data analysis (modified from Sreejesh & Mohapatra, 2013).

4.6.1 Pilot study

The pilot study is aimed to test whether the questionnaire in both languages is consistency, and the responses understand it correctly. This is because the construct is developed based on English literature, while the questionnaire in final stage survey is running in Thai due to the population and sample in this study is Thai. To ensure the consistency of the translation in language, a translation of questionnaire is proven by a certified English-Thai translator (APPENDIX H), then a paired sample t-test is employed to explore if there is a significant difference between the means of two groups or not. If it has occurred, the authors will need to seek the cause of difference and revise the questionnaire and rerun the pilot test. This is to reduce a measurement error in a

misunderstanding of questionnaires or to misinterpret the results. Hence, a paired sample t-test is useful to test the significant difference between two groups that are not independent (Hair et al., 2014). To compare the means of the two paired sets of data, the differences between all pairs must be, first, calculated. The t statistic to test whether the means are different can be calculated as Formula (2):

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left(\frac{sd_{diff}}{\sqrt{n}} \right)} \quad (2)$$

Where; \bar{x}_1 is the average value of each sample in set1

\bar{x}_2 is the average value of each sample in set2

sd_{diff} is the standard deviation of the difference

n is the sample size

In the t-test, null hypothesis (H_0) is defined as a population means are equal for the two samples. The null hypothesis is rejected if $|T| > t_{1-\alpha/2, df}$

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

Where the critical value of t distribution corresponding to a selected 95% confidence level as recommended in literature (Samuels, 2015). And degrees of freedom (df) used in this test are: $df=n-1$

4.6.2 Data screening process

Data screening is a process to ensure that the data is ready to use before any additional statistical analysis is further applied. As mentioned by Gaskin (2018), the data screening process is required to guarantee that the data can be used reliably and correctly for theory testing. In this study, there are five specific data screening items to be fixed which will be explained in section 4.6.2.1 – section 4.6.2.5

4.6.2.1 Missing data analysis

Missing data is a case where valid value on at least one variable are missed and it is not be able for data analysis (Hair et al., 2014). Missing data is the case that is often found in all branches of research (Prasitwattanaseri & Prasitwattanaseri, 2006).

Researchers need to consider the appropriate ways to deal with lost data by deciding which method will be used to manage the lost data, which then resulting in distortion of analysis results or it can cause a less power of the test due to sampling size to be used are reduced as a result of the removal of lost data from the study (Prasitwattanaseri & Prasitwattanaseri, 2006). As highlighted by Hair et al. (2014) there are four main steps of missing data options to consider as follow;

Step1: Determination the type of missing data

Data can be determined into two types which are ignorable and data that are not ignorable.

For the first one, the data is called as ignorable when:

1. The selected sample is not covering all population. To overcome this problem, a probability sampling technique is needed when designing the sample selection procedure (Hair et al., 2014).
2. Researchers design a skip pattern or censored data in their questionnaire.

For the latter one, which is the data that is not ignorable. Generally, it can divide into the data is missed due to known and unknown factor (Hair et al., 2014). For the known reason, such as morbidity of questionnaires, and the unknown reason, for instance, a refusing to answer in specific questions.

Step2: Determination the extent of missing data

this step, it needs to justify that cases and variables with missing data should be deleted or not. The deletion of variables is considered whether the amount of missing data will affect the result in data analysis or not (Hair et al., 2014). In many pieces of literature, variables will be deleted when it has more than 50 percent of missing data (Hair et al., 2014; Kline, 2011; Prasitwattanaseri & Prasitwattanaseri, 2006).

Step3: Identification randomness of missing data

Consideration the randomness of missing data, is an important step. This is because if the researcher can justify the nature of missing data, it will help in choosing an appropriate imputation method (Gaskin, 2018). The pattern of randomness of missing data can classify into two main types:

- 1. Missing completely at random (MCAR)**

MCAR is the characteristic of missing data that occurs completely random on all observations. Besides, data is missing independently. To test that data is missing completely at random or not, grouping observations can examine it into two groups: the whole group, and data missing group. Data is classified as MCAR if there are no significant differences between the two groups for various variables in the database (Gaskin, 2018). There are many reasons why missing occurs, such as inconsistencies of equipment, or the imported of data is wrong.

- 2. Missing at random (MAR)**

MAR has occurred when the value of missing data depends on other variables in the database, which is not the variable of missed data itself. For example. If the result reveals that for those who have a lower educational level group tend to have lower cooperation in answering questions about the attitude towards drug use, in this way, it can summarise that the attitude towards drug use variable is missing at MAR (Gaskin, 2018; Prasitwattanaseri & Prasitwattanaseri, 2006). To test that the data is missing at MAR or not, there is a missing value analysis in SPSS which offer both MAR and MCAR diagnostic test (Hair et al., 2014; Kline, 2011).

Step4: Selection of imputation method

There are many ways to deal with missing data. The decision of which imputation method is being used depends on the nature of the missing data. If choosing an inappropriate method, it may create damage and inaccurate in the analysis of the result. Imputation method is explained as follow:

- 1. Imputation using only valid data**

There are two sub-methods in data imputation using only valid data which are ***listwise data deletion*** and ***pairwise data deletion***. Listwise data deletion is a straightforward way to deal with missing data by do not pay attention to the data that contains a missing value. Hence, only complete data will be analysed(Hair et

al., 2014). This approach will be suitable if the amount of missing data is minimal and it often prescribed as a "by default" for the management of missing data in general statistical computer programs (Gaskin, 2018). While a pairwise data deletion is a way to deal with lost data in the event of an analysis of the relationship between variables will be analysed from the complete data in both variables (Prasitwattanasari & Prasitwattanasari, 2006).

2. Imputation using replacement values

Estimated values from all available data impute the replacement of missing values in this method. Generally, there are five main methods of replacement values which are: **hot deck imputation**: which is to determine which sample unit has the most similar to the missing sample, then replace the missing value by the value of that similar sample unit, **case substitution**: entire values are replaced by selecting a substitution case from non-sampled observation, **mean substitution**: which is a way to replace the missing data by a mean value of the known data in each variable, and **regression imputation**: that a substitution value is calculated based on a regression model which is formulated for each variable, and the **model-based methods**: which is useful for the case of MAR missing data process (Hair et al., 2014; Kline, 2011; Prasitwattanasari & Prasitwattanasari, 2006). Pros and cons, including the justification for the best use of each method, will be explained in Table 4-9

As explained in Table 4-9, each method has its own merits and their disadvantages, however, in this study, as an expected sample of the study is the large sample size, hence many pieces of literature recommend to use only complete data if the percentage of missing cases less than 10 percent and the dataset is large enough (Gaskin, 2018; Hair et al., 2014). This is to reduce bias in missing data imputation process (Prasitwattanasari & Prasitwattanasari, 2006). Moreover, if the missing case is between 10 to 50 percent, a regression imputation is used for the MCAR as its relationship sufficiency established, in addition, it suitable for moderate to high levels of missing data. At the same time, the model-based method is chosen if the missing data are MAR (Hair et al., 2014). The process of missing data remedies is illustrated in Figure 4-6, which is a conclusion of the 4-steps of missing data process.

Table 4-9 Comparison of imputation techniques for missing data (Hair et al., 2014).

Imputation method	Pros	Cons	Best used when
Listwise data deletion	<ul style="list-style-type: none"> • Simplest to implement • Default for many statistical model 	<ul style="list-style-type: none"> • Most affected by non-random processes • Greatest reduction in sample size • Lower statistical power 	<ul style="list-style-type: none"> • Large sample size • Strong relationships among variables • Low level of missing data
Pairwise data deletion	<ul style="list-style-type: none"> • Maximize use of valid data • Result in largest sample size possible without replacing value 	<ul style="list-style-type: none"> • Varying sample size for every imputation • Can generate “out of range” values for correlation and eigenvalues 	<ul style="list-style-type: none"> • Relatively low levels of missing data • Moderate relationships among variables
Hot deck imputation	<ul style="list-style-type: none"> • Replaces missing data with actual values from the most similar case or best-known value 	<ul style="list-style-type: none"> • Must define suitably similar cases or appropriate external values 	<ul style="list-style-type: none"> • Established replacement values are known, or • Missing data process indicates variables upon which to base similarity
Case substitution	<ul style="list-style-type: none"> • provides realistic replacement values (i.e., another actual observation) rather than calculated values 	<ul style="list-style-type: none"> • Must have additional cases not in the original sample • Must define similarity measure to identify replacement case 	<ul style="list-style-type: none"> • Additional cases are variable • Able to identify appropriate replacement cases
Mean substitution	<ul style="list-style-type: none"> • Easily implemented • Provides all cases with complete information 	<ul style="list-style-type: none"> • Reduce variance of the distribution • Distorts distribution of the data • Depresses observed correlations 	<ul style="list-style-type: none"> • Relatively low levels of missing data • Relatively strong relationships among variables
Regression imputation	<ul style="list-style-type: none"> • Employs actual relationships among the variables • Replacement values calculated based on an observation’s own values on other variables • Unique set of predictors can be used for each variable with missing data 	<ul style="list-style-type: none"> • Reinforces existing relationships and reduces generalizability • Must have sufficient relationship among variables to generate valid predicted values • Understates variance unless error term added to replacement value • Replacement values may be “out of range” 	<ul style="list-style-type: none"> • Moderate to high levels of missing data • Relationships sufficiently established to not impact generalizability • Software available
Model-based methods	<ul style="list-style-type: none"> • Accommodates both non-random and random missing data processes • Best representation of original distribution of values with least bias 	<ul style="list-style-type: none"> • Complex model specification by researcher • Requires specialized software • Typically, not available directly in software programmes (except EM method in SPSS) 	<ul style="list-style-type: none"> • Only method that can accommodate non-random missing data processes • High levels of missing data require least biased method to ensure generalizability

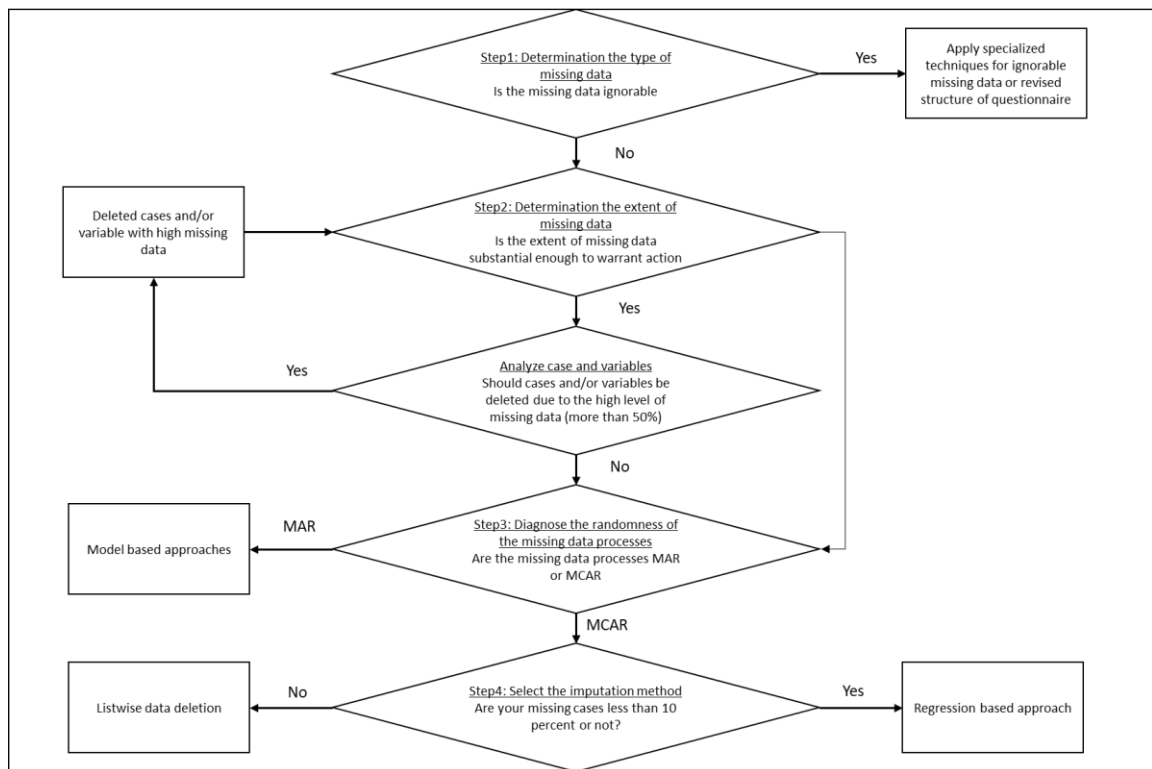


Figure 4-6 A four-step process of missing data remedies (modified from Hair et al., 2014).

4.6.2.2 Multivariate outlier

Multivariate outliers refer to records that do not match the standard set of correlations shown by other records in the data set, regardless of the cause model (Kline, 2011). For example, if everyone in the data set reports that food has a positive effect on weight loss, but someone reported that they gained weight when he lost weight, their data are the multivariate outlier. In other word, outliers can be defined as particularly influential observations which are data points that are incredibly distant from others (Leys et al., 2019). There are many approaches to detect an outlier depending on the application and number of observations in the data set (Walfish, 2006), however, in this study, Cook's distance, which provides an overall measure of the impact of an observation on the estimated regression coefficient is applied as it can visualizer shows a stem plot of all instances by index and their associated distance score (Gaskin, 2018; Walfish, 2006). In the study on the power of outlier by Osborne & Overbay (2004) showing the substantial benefits of eliminating multivariate outlier on the considerable increase of accuracy, and the error of the inference tends to decrease significantly. In this study, the author will follow the cut-off value of Cook's distance at 1 for item deletion, as recommended by Gaskin (2018).

4.6.2.3 Normality

Most statistical tests rest upon the assumption of normality. Deviations from normality, called non-normality, render those statistical tests inaccurate, so it is essential to know if the data are normal or non-normal. To test the normality of data, skewness and kurtosis is applied. Skewness refers to the shape of a unimodal distribution that is not symmetrical with the mean. A positive skew indicates that most scores are below the average, while negative slopes indicate opposite (Kline, 2011). The illustration of skewness is shown in the upper part of Figure 4-7, in which an example of positive or negative skewed distributions is compared to regular curve graphs. While, kurtosis refers to the height of the curve, in which a positive kurtosis indicates more massive tails and higher peaks, while negative kurtosis indicates the opposition both are in comparison to normal distributions with the same variances. Distribution with positive kurtosis is described as leptokurtic, and distributions with negative kurtosis are described as platykurtic (Hair et al., 2014; Meyers et al., 2016). As recommended by many studies, the liberal thresholds of skewness and kurtosis are between -2 to +2 (Gaskin, 2018; Jituea & Pasunon, 2018). The illustration of kurtosis is shown in the lower part of Figure 4-7.

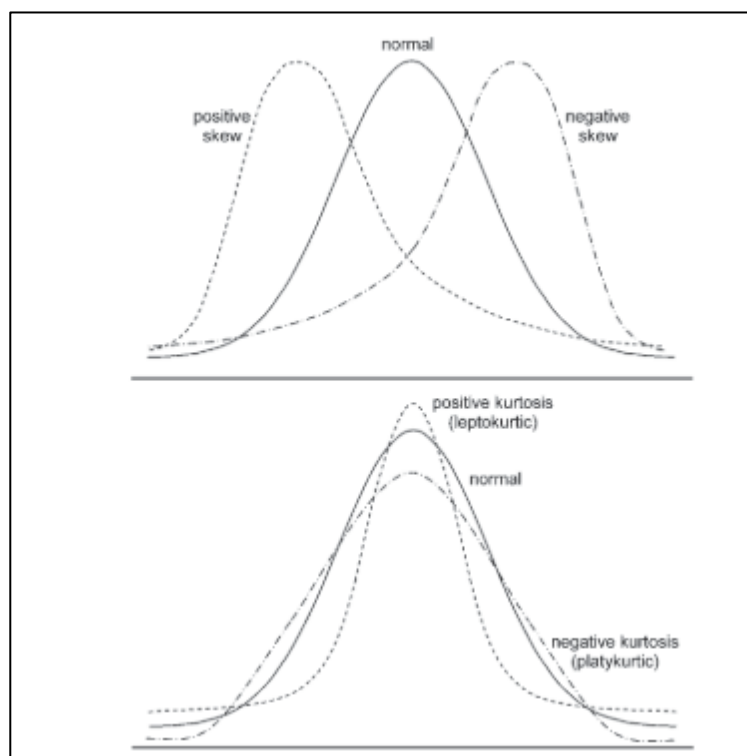


Figure 4-7 Distributions with positive skew or negative skew (top) and with positive kurtosis or negative kurtosis (bottom) relative to a normal curve (Kline, 2011).

4.6.2.4 Linearity

Linearity refers to the consistent slope of change that represents the relationship between independent variables (IV) and dependent variables (DV). If the relationship between IV and DV is entirely inconsistent, it will affect SEM analysis which required to use a data transformation to deal with these nonlinearities which involve the changing the metric for either X-axis or Y-axis. There are both graphical (simple scatter plot) and statistical methods for evaluating linearity. However, to test linearity in this study is being done by the deviation from linearity test available in the ANOVA test in SPSS, if the Significant value for deviation from linearity is less than 0.05, hence, the relationship between independent variables and the dependent variable is not linear (Gaskin, 2018). A reduction in outlier will result in better linearity (Jituea & Pasunon, 2018).

4.6.2.5 Multicollinearity

Multicollinearity refers to a situation in which two or more explanatory variables in a multiple regression model are highly linearly related (Kline, 2011). The way to check this is to calculate a Variable Inflation Factor (VIF) for each independent variable after running a multivariate regression. The rules of thumb for the VIF proposed by (Gaskin, 2018) that if the VIF value is more than 5, it is very likely to cause a problem. Hence, it is required to drop the problematic value out. To sum up, the data screening process and selected criteria are illustrated in Table 4-10 to draw the attention of the reader.

Table 4-10 A summary of data screening methods and criteria in this study

Issues	Methods	Criteria	References
Missing data	<ul style="list-style-type: none">• Listwise data deletion• Regression imputation (MCAR)• Delete cases/variables	<ul style="list-style-type: none">• If the missing of samples data < 10%• if the missing data is 10 - 50 %• If the number of missing cases/variables > 50%	(Hair et al., 2014; Kline, 2011)
Multivariate outlier	<ul style="list-style-type: none">• Cook' s distance	<ul style="list-style-type: none">• <1	(Osborne & Overbay, 2004)
Normality	<ul style="list-style-type: none">• Skewness and kurtosis	<ul style="list-style-type: none">• Between -2 to 2	(Jituea & Pasunon, 2018)
Linearity	<ul style="list-style-type: none">• Deviation from linearity test	<ul style="list-style-type: none">• < 0.5	(Gaskin, 2018)
Multicollinearity	<ul style="list-style-type: none">• VIF value	<ul style="list-style-type: none">• <5	(Gaskin, 2018)

4.6.3 Exploratory factor analysis (EFA)

Following the pilot study, the construct was tested using EFA to calibrate and revise for the measurement model. In this step, the Statistical Package for the Social Sciences (SPSS) version 26 was employed to test the EFA. EFA is a statistical method to discover an underlying relationship between variables in a data set (Hair et al., 2014). While, Jituea & Pasunon (2018) highlighted that EFA focuses on the study of relationships and interdependence between variables. Therefore, there are no independent or dependent variables in EFA. The result from EFA can provide a factor structure based on its correlation. In other words, EFA prepares variables to use for creating cleaner structural to be used in equation models. Researchers use EFA to define the suitable variables and its component to be created from those variables (Gaskin, 2018). This is because researchers cannot know in advance, which components would be made. The benefits of the EFA over the Confirmatory Factor Analysis (CFA) is that there is no preliminary theory about items belonging to the structures being used (Gaskin, 2018). This means that adopting the EFA will allow the researcher to be able to see the problematic variable more quickly than the CFA. Details of EFA will be discussed in section 4.6.3.1 – section 4.6.3.4

4.6.3.1 KMO and Bartlett's test

Kaiser-Meyer-Olkin (KMO) is a test of sampling adequacy showing the proportion of variation in variables that may be caused by underlying values. The high value of KMO (close to 1) indicates that the data are suitable to perform factor analysis. The cut-off value for KMO in this study is set at 0.7 (Gaskin, 2018). While, Bartlett's test of sphericity tests whether a proposed correlation matrix is an identity matrix or not, which identity matrix indicates that variables are unrelated (Hair et al., 2014). Significance level at below 0.005 indicates that factor analysis is useful with the data.

4.6.3.2 Communalities

Communalities is the proportion of each variable's variance that can be explained by the factors (e.g., the underlying latent continua). A cut-off communality in this study will follow the recommendation of Gaskin (2018) to remove items with a low communality value (<0.4) as it can affect to the validity and reliability of the constructs.

4.6.3.3 Factor structure

A factor structure is a correlational relationship between variables that are being tested at a particular construct in EFA. Generally, there are two main things to be considered in factor structure. The first one is to explore if there is a significant cross-loading between factors or not (A single variable that has a loading value onto more than one construct), and the last one is to observe the low loading value as it will affect convergent validity of EFA (Sreejesh & Mohapatra, 2013).

Accuracy of the constructs is justified based on the convergent validity, discriminant validity, face validity, and reliability. **Convergent validity** is commonly used in sociology, other behavioural sciences. It means the level of degree to which two measures of constructs that should be theoretically relevant, are in fact, relevant. The justification of convergent validity for EFA in this study is based on the loading factor. High factor loadings indicate high convergent validity. In this study, however, the cut-off value of 0.50 was used as a rule of thumb (Gaskin, 2018). This value of factor loading also conforms with the convergent validity to be used in CFA with the verification through the average variance extracted (AVE) at cut-off value 0.5. To assess the **discriminant validity** of the construct, it can be done through a correlation matrix. The model will be proved to have a discriminant validity if their intercorrelation values amongst constructs are below 0.7 (Gaskin, 2018; Hair et al., 2014). **Face validity** is the extent to which the test is seen as a perspective that covers the concepts to be used in measurements. It refers to the transparency or relevance of the test as it appears in the test participants. To consider a face validity in EFA, it is merely to look at the pattern matrix. All the variable that has a similar in nature must be load onto the same factor (Gaskin, 2018).

To confirm the **reliability** of the construct, Cronbach's alpha (α) is applied. Cronbach's alpha is a measure of internal consistency, which is to test how closely the relationship between items with the group is. It is considered as a measure of the reliability of scales. A generally accepted rule is that α of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or higher indicates an outstanding level (Beauducel & Wittmann, 2005; Hair et al., 2014; Meyers et al., 2016). However, the cut-off value of this study is set at 0.7 to refer to (Gaskin, 2018). This value of (α) also conforms with the reliability to be used in CFA with the verification through the composite reliability (CR) which is considered as a measure of the reliability of this study at CR value of 0.70.

4.6.3.4 Common method bias

The common method bias (CMB) occurs when the variability of the response is caused by the tool rather than the actual inclination of the respondents, which the instrument tries to reveal. This tool will suggest bias; therefore, the results will be contaminated with 'noise' caused by biased tools (Thoumrungroje, 2017). One of the common ways to test whether CMB is relevant to the studies is that the use of Harman single-factor score, which all items will be loaded as one common factor. If the total variance for a single factor is less than 50%, then CMB does not affect the data.

4.6.4 Confirmatory factor analysis (CFA)

CFA is one of the factor analysis tools that is most commonly used in social research. It is used to test whether the measurement of the structure corresponds to the researchers' restriction or not (Beauducel & Wittmann, 2005). In other words, CFA is used to determine the factor structure of your dataset (Gaskin, 2018). In this study, the author employs Statistical programs of Analysis of Moment Structures (AMOS) version 26 to test the CFA, in order to confirm the validity of the measurement model. Hence, a good measurement model would depend on the validity and reliability which will be explained in section 4.7

4.6.5 Structural equation modelling using AMOS

SEM is a general statistical method for testing theoretical hypotheses in operational research, where path analysis is performed for the analysis of the hypothetical relationship between latent variables (construct) (Beauducel & Wittmann, 2005; Hair et al., 2014; Kline, 2011; Shi et al., 2019). Through the application of the SEM, the hypothesis (the causal relationship between the structures) is tested statistically, and the path coefficient is calculated to show the strength of the causal impact. In this study, the theoretical models in section 3 were examined using the SEM method.

The SEM model consists of a measurement model and a structural model. Structure model is the name of the inner model which shows the relationship between endogenous and exogenous structures, while, external model or measurement model shows the relevant indicators of each construct (Henseler et al., 2009; Kline, 2011). Figure 4-8 illustrates the basic SEM model with a single exogenous structure and one endogenous

structure. The measurement model on the left measure the exogenous structure (ξ) according to the indicator (X) with the consideration of the measurement error (δ). The endogenous structure (η) on the right-hand side of the model, is measured by the indicator (Y), along with the measurement errors (ε). To summarize, the SEM method. Test each hypothesis as a causal relationship between the two structures through the indicator. Relevant pointers, which are displayed as text in the questionnaire to capture the perception of the respondents.

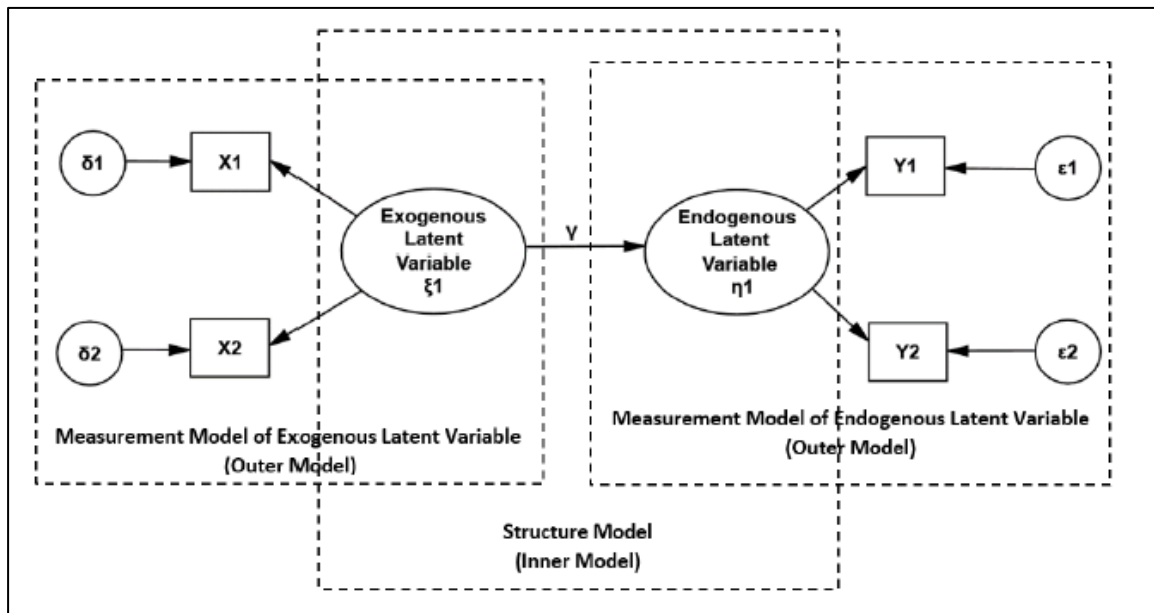


Figure 4-8 Basic SEM model (Henseler et al., 2009; Zhang, 2018).

4.7 Model fit

4.7.1 Goodness of fit

The main statistical measurements to compare estimates and observed covariance is Chi-square (χ^2). The Chi-Square value is the primary measure for evaluating the overall model and evaluating the size of the discrepancy between the sample and the appropriate covariance matrix (Hu & Bentler, 1999). In the approximation χ^2 , researchers are interested in 'not important' as it is an indicator that the observed variance-covariance matrix is no different from the approximate matrix. If it has a calculated probability (p-value) greater than or equal to 0.05, it indicates that the model is consistent with the full empirical data (Gaskin, 2018). It is, however, difficult to find a perfectly harmonious model. This is because, χ^2 is heavily influenced by the sample size, increasing the sample

size will increase the value of χ^2 . Hence, it is widely recommended to use the proportion of chi-square divided by degree of freedom (χ^2 / df) instead. The recommended value of chi-square/degree of freedom (CMIN/df) is between 1-3 (Hair et al., 2014). However, many suggested to modulate it to 5 as indicate of mediocre fit (Lei et al., 2017; Se & Priyawan, 2019; Soleimani et al., 2016). Therefore, in this study, the cut-off value of CMIN/df is selected at <5 .

To overcome limitations in terms of sensitivity to sample size of the χ^2 statistic, many works of literature recommend to devised alternatives model fit indices, which can be classified into three types of fit indices including absolute fit indices, incremental fit indices, and parsimony fit indices (Gaskin, 2018; Hair et al., 2014; Kline, 2011; Lei et al., 2017). For the absolute fit indices, this measure is the most basic indicators of how well the proposed theory fits data. Unlike the absolute fit index, their calculations do not depend on comparisons with basic models, and it is instead a measure of how the model is appropriate compared to no model (Hooper et al., 2008).

Even if, there are many fit indices in each group, e.g., (RMSEA), goodness-of-fit statistic (GFI) and the adjusted goodness-of-fit statistic (AGFI), normed-fit index (NFI), comparative fit index (CFI), and Tucker-Lewis index (TLI), as recommended at least one fit indices per group should be reported as it can be a representative of each family (Hair et al., 2014; Kline, 2011). Therefore, this study will use RMSEA, CFI, and TLI to be a representative for these fit indices. This is because of two main reasons: first, these two indices are normed to a 0-1 scale. Hence, it is easier to interpret the result, second, these indices are relatively insensitive to the sample size effects (Hooper et al., 2008).

In SEM, application of RMSEA, CFI, and TLI highly relies on the conventional cut-off values developed under normal-theory maximum likelihood (ML) with continuous data (Xia & Yang, 2019). RMSEA, CFI and TLI applications occur in a series of elimination criteria. Suggestions for RMSEA have dropped dramatically over the last fifteen years. Then the RMSEA is thought to be between 0.08 to 0.10 to fit (MacCallum et al, 1996). However, more recently, researchers recommended the cut off value at 0.08 to show a reasonable fit (Hooper et al., 2008). Therefore, a cut-off value for RMSEA in this study will be set at 0.08. CFI and TLI are more widely used by researchers and should be an index of choice because it is not sensitive to the complexity of the model (Bentler, 1990; Byrne, 2010). They recommended a value higher than 0.90 is recommended to fit well with models.

Therefore, in this study, the recommend CFI and TLI to show the model fit will be set at over 0.9. Recommend value of the fit index in this study is summarised in Table 4-11

Table 4-11 Summarise of recommend value of fit index in this study (modified from Hair et al., 2014)

Fit index	Recommended value in this study
Chi-square/degree of freedom (CMIN/df)	<5
Root mean square error of approximation (RMSEA)	<0.8
Comparative fit index (CFI)	>0.9
Tucker-Lewis index (TLI)	>0.9

4.7.2 Validity and reliability

The next step, which is one of the main objectives in the CFA, is to confirm the validity of the measurement model, which is being done by the testing of validity and reliability of measurement model. Measurement accuracy is justified based on how the measured items reflect the underlying builds assigned to them. Many tests can confirm the validity and reliability in CFA, however, the most widely used are convergent validity, discriminant validity, and reliability (Gaskin, 2018; Hair et al., 2014; Shi et al., 2019). These components were then applied in this thesis to assess the measurement model.

Convergent validity refers to the measured items converging for a specified latent structure (Kline, 2011). The assessment can be verified through the average variance extracted (AVE). The AVE shows the total number of variances in the indicator accounted for by the latent variable. To calculate AVE, it can be obtained by the sum of squares of standardized factor loadings divided by this value plus the total of error variances for indicators. AVE at 0.50 or higher indicating that there is a sufficient convergence, with AVE is less than 0.50 indicating that the measurement error is greater than the variability captured by the construct (Gaskin, 2018; Hair et al., 2014). A cut-off value of AVE, therefore, will be set at 0.50.

Discriminant validity examines if two latent constructs are distinct (Hair et al., 2014). It can be assessed by comparing the maximum shared variance (MSV) with the AVE

estimates. Discriminant validity for each construct is achieved if AVE for its construct is higher than MSV (Gaskin, 2018; Kline, 2011). This is evidence to prove that the construct is distinct.

To confirm the **reliability** of the measurement model, composite reliability (CR) is considered as a measure of the reliability of this study. CR value of 0.70 or higher suggests excellent reliability with values between 0.60 to 0.70 deemed acceptable (Hair et al., 2014). However, this study will set a cut-off value at 0.7 refer to Gaskin (2018). CR value can be calculated from the square of the sum of the loading factor in each construct divided by the sum of error of each factor in each construct.

When the reliability and validity of the measurement model are satisfied, the structural model is evaluated. Path analysis, a simpler version of SEM, was used to test proposed relationships. In testing a structural model, two issues are examined: First, the model fit is used to decide whether to accept the proposed model and the second, structural parameter estimation (Hair et al., 2014).

Table 4-12 Summarise of cut-off value for validity and reliability of measurement model (modified from Hair et al., 2014; Gaskin, 2018).

Components	Index	Recommended cut-off value
Convergent validity	AVE	<0.5
Discriminant validity	MSV	If MSV>AVE
Reliability	CR	<0.7

4.8 Ethical consideration

According to Blumberg et al. (2008), ethics is to “conduct the research in a moral and right way in which the participants does not suffer physical harm, discomfort, or loss of privacy”. This view is supported by Collis & Hussey (2014) who highlights that it is challenging to research without considering the ethical issue. The authors mention that there are two main issues that the researcher should clarify and discuss concerning the ethic policies when doing research which is the voluntary participation, and anonymity and confidentiality.

For the voluntary participation, the researcher should provide information about what is needed if the participant wants to take part in the survey, and what they will get back as a benefit for undertaking this study, and how long to complete questionnaires. In some cases, participants are required to follow the steps. If they do not receive any permission from their supervisor to participate in this study, the researcher must specify other samples. Hence, an information leaflet was provided to respondents and covered several aspects, such as voluntary participation and withdrawal from participating, the anonymity of respondents and for how long the data would be kept. Participation in this questionnaire was entirely voluntary. As such, respondents could withdraw at any time without giving a reason, by closing the web browser, or returned a blank paper, but they could not withdraw once the data were submitted.

In terms of anonymity and confidentiality, the questionnaires did not contain the respondents' names or their initials to ensure the anonymity of the respondents. The researcher should be aware of mentioning the name and singling out one response for analysis (Creswell, 2014). Responses, therefore, will not be identified individually. All responses will be compiled together and analysed as a group. Furthermore, the researcher needs to ensure that the responses are confidential, which means the study will be held and processed to be used anonymously for internal publication that cannot be traced back to the organisation. Ethical conduct involves the organisation and the associates that sponsor the research, the researchers who carry out the research, and the respondents who participate in providing the data.

Since this study involved humans, ethical approval was sought from the Biomedical and Scientific Research Ethics Committee (BSREC) and the approval of REGO-2019-2367 was obtained from the committee. The attached consent form, ethical approval, and the information leaflet, which have been sent to the participants with the questionnaire, are shown in the Appendix F, C and E, respectively. The consent form was sought when respondents completed the questionnaire, and it is on the front page of the questionnaire. Without the signature in the consent form, data cannot be used for further analysis as it indicates the unwilling to take part in this study. The collected data are to be stored for ten years on a university computer and shared with the supervisors and other researchers who plan to publish together in the future.

4.9 Chapter summary

The key findings of this chapter are summarised in Table 4-13

Table 4-13 Summary of key findings in research methodology chapter

<p>Philosophical stance, research approach, and research method</p> <p>This study applies a Positivism philosophy with a deductive research approach and quantitative research method as a basic philosophical stance.</p>
<p>Survey research design</p> <p>There are two main phases in survey, pilot study and final survey.</p>
<p>Phase1: Pilot study survey</p> <p>The pilot study is aimed to test whether the questionnaire in both languages is consistency, and the responses understand it correctly. This is because the construct is developed based on English literature, while the questionnaire in final stage survey is running in Thai due to the population and sample in this study is Thai. An online web-based software, namely Qualtrics is used during the data collection in Pilot study. 200 emails were generated and sent to student who study in an international programme in Thailand, as expected that they understand English and Thai language fluently. In total, the number of responses is 43 out of 200 of total contact, which is calculated into the response rate of an online web-based survey for 21.5 percent</p>
<p>Phase2: Final survey</p> <p>A calculation of required sample size is shown that the minimum sample size in this survey is 384. Researcher decided to double up to 800 to reduce an error in non-response case. In the selection of sample, researcher classified the population into stratum based on the information provided by the office of the higher education commission (OHEC) in Thailand (OHEC, 2020). Generally, the university in Thailand can be classified into large and small university based on the number of enrolments of a full-time student. 4 university from a large university, and 4 university from a small university will be selected randomly through a simple random technique. The result comprises of (TU), (MU), (PSU), (SSRU) as a representative for the large university, and (TSU), (RMUSV), (WU), and (MSU) for the small university. 100 samples per institution are recruited using a systematic random sampling technique based on the database of student number in each university. In total, 800 paper-based questionnaires were delivered to the respondent.</p>
<p>Data analysis</p> <p>Two-step approach was followed. A measurement model will be tested first to test the calibration of the construct by EFA. The validation of the structural measurement model is then being tested to check a verification of model feasibility and its generalizability by CFA and SEM (Kline, 2011). Sample will be divided in to two groups; 250 samples for construct calibration will be withdrawn from the total sample size. And the rest will be used for model validation.</p>
<p>Goodness of fit, validity and reliability</p> <p>Summarise of recommend value of fit index in this study are: CMIN/df <5, RMSEA <0.8, CFI >0.9, and TLI > 0.9. While, the cut-off value validity and reliability are AVE<0.5, or if MSV > AVE, or CR value <0.7</p>

5 Analysis and results

5.1 Chapter overview

This chapter presents the results of the survey findings, together with the analysis of the result. The consistency in translation of questionnaires into the Thai language is tested through a pilot study in section 5.2. Data from the survey finding stage will be firstly analysed and screened through the data screening process in section 5.3 to ensure the adequacy of data. After that, the construct in this model is tested using exploratory factor analysis (EFA) to calibrate and revise for the measurement model in section 5.4. In this step, the Statistical Package for the Social Sciences (SPSS) version 26 was employed to test the EFA. The revised constructs in the measurement model will be further calibrated by confirmatory factor analysis (CFA) in section 5.5 to ensure validity and reliability of this model. A structural model is evaluated by statistical programs of analysis of moment structures (AMOS) version 26, following a standard procedure, and the hypothesis testing results are presented in section 5.6. Finally, analysis and results will be recapped in section 5.7. The structure of this chapter is illustrated in Figure 5-1

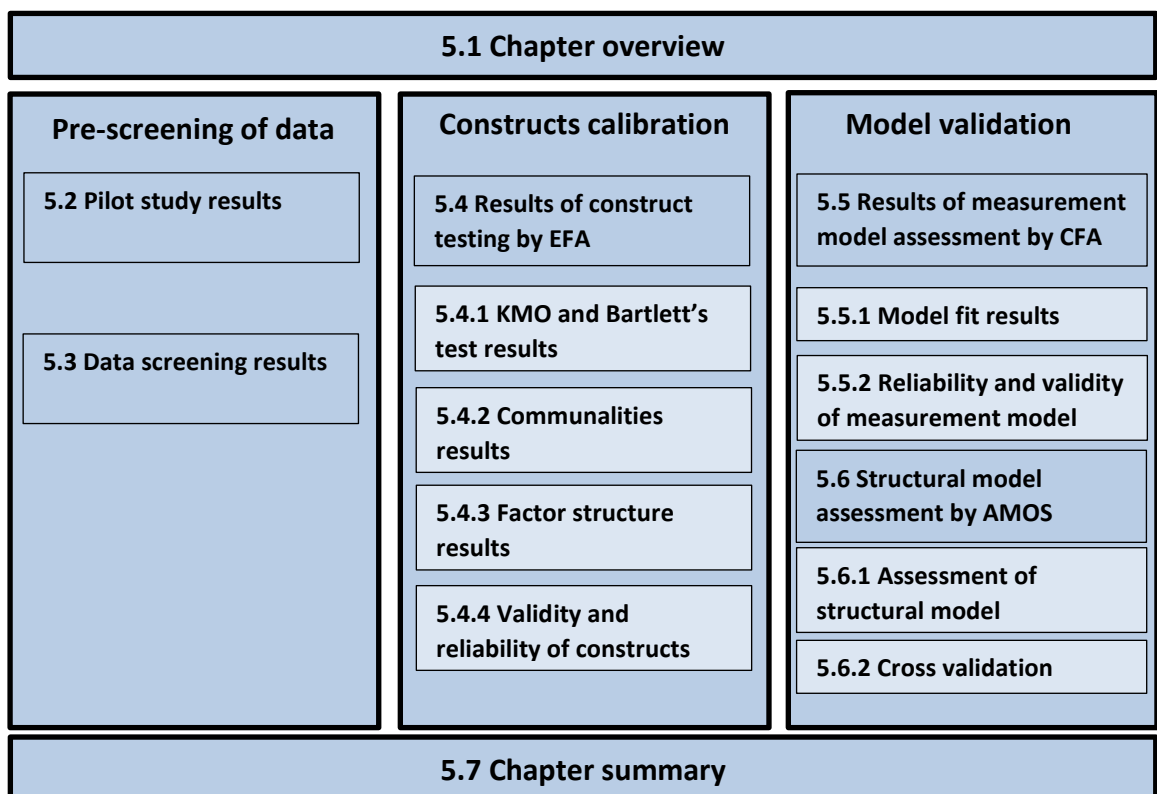


Figure 5-1 A structure of analysis and result chapter

5.2 Pilot study result

The pilot study is aimed to test whether the questionnaire in both languages is consistency, and the responses understand it correctly. This is because the construct is developed based on English literature, while the questionnaire in final stage survey is running in Thai due to the population and sample in this study is Thai. To ensure the consistency of the translation in language, a paired sample t-test is employed to check if there is a significant difference between the means of two groups or not. If it has occurred, the authors will need to seek the cause of difference and revise the questionnaire and rerun the pilot test. A paired sample t-test is useful to test the significant difference between two groups that are not independent (Hair et al., 2014). In this section, a demographic profile of participants in the pilot study will be presented, and the result of paired t-test will be discussed.

5.2.1 Demographic profile of pilot study

A sample in the pilot study is selected based on two criteria:

- (1) Sample in pilot study need to be a Thai undergraduate student as it is required to conform to the sample in survey stage.
- (2) Sample in the pilot study needs to understand both Thai and English language fluently.

Therefore, 200 students in international colleague in Thailand were contacted regarding the database provided by an office of educational affairs. As an expectation that they should fluently understand English and Thai language. Two hundred e-mails were generated and sent together with the explanation of research objectives, data collection frame and process, along with an ethical consideration and their contacting information. A link to Thai and English set of questionnaires on Qualtrics (online survey platform: www.qualtrics.com) were also attached in these e-mails which required them to fill in both set of questionnaires.

To achieve a minimum number of required sample size at 30 response, two follow-up e-mails were sent out to increase the response rate. The initial e-mail was sent out in the first week of June 2019, followed by two reminder e-mails in the two-following weeks of

June 2019. In total, the number of responses is 43 out of 200 of total contact, which is accounted for 21.5 percent as expected to be approximately 20 percent regarding the similar study in operation and management which employed an online web-based survey, for instance, de Giovanni (2012): 17.1%, and Zhang (2018): 17.7%.

A demographic profile of the respondent in the pilot study is illustrated in Table 5-1 in which the diversity of the respondents in terms of gender, year of study, university, and area of study is explained.

Table 5-1 Demographic background of respondents in pilot study

Characteristics		Volume	frequency
Gender	Male	18	42%
	Female	25	58%
Year of study	1	15	35%
	2	19	44%
	3	7	16%
	4	2	5%
University	Chulalongkorn university (CU)	16	37%
	Kasetsart University (KU)	1	2%
	Mahidol University International College (MUIC)	5	12%
	Prince of Songkla University International College (PSUIC)	2	5%
	Thammasat University (TU)	19	44%
Area of study	Biotechnology	2	5%
	Economics	8	19%
	Engineering	3	7%
	Information and Communication technology	3	7%
	International Business Management	16	37%
	Language and humanities	7	16%
	Politics and Global Studies	4	9%

From Table 5-1, in terms of gender, 42 percent of respondents in the pilot study are male, while 58 percent are female. The highest number of respondents are in year 2, following by year 1,3, and 4, respectively. Respondents study in an international college at one of these following university; Chulalongkorn University (CU), Kasetsart University (KU), Mahidol University International College (MUIC), Prince of Songkla University International College (PSUIC), and Thammasat University (TU). The frequency of participants in terms of their studied university range between the highest frequencies at 44 percent for Thammasat University to 2 percent at Kasetsart University. Besides, most of the respondents' study in the area of international business management, followed by faculty of economics, language and humanities, politics and global studies, engineering, information and communication technology, and biotechnology, with the frequency at 37%, 19%, 16%, 9%, 7 %, 7%, and 5% respectively. Respondents in the pilot study will be used to test whether there is a significant difference in questionnaire translation from English to Thai or not and the result of the test will be discussed in Section 5.2.2

5.2.2 Paired t-test

A paired t-test is employed in this study to determine if the average difference between the two sets of observations is zero. This is the best use when an entire sample testing is measured twice, resulting in a paired observation. Results of paired t-test will be illustrated in Table 5-2 showing a sample result of the paired t-test, which showing the differences in mean, standard deviation, standard error mean, lower and upper bound at 95% confidence interval level, with the t-value, degree of freedom (df) and significant value (p-value). Further results of t-test which are a full result of paired t-test and correlation table will be given in APPENDIX I and J, respectively.

Table 5-2 A sample of paired t-test result

Pair	Variables	Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Diff.		t	df	Sig. (2-tailed)
					Lower	Upper			
1	Reward1Th - Reward1En	0.14	0.64	0.097	-0.057	0.336	1.43	42	0.16
2	Reward2Th - Reward2En	0.09	1.17	0.179	-0.267	0.454	0.52	42	0.61
3	Reward3Th - Reward3En	-0.02	0.27	0.041	-0.105	0.059	-0.57	42	0.57
4	Reward4Th - Reward4En	0.09	0.57	0.087	-0.082	0.268	1.07	42	0.29
5	Reward5Th - Reward5En	-0.02	1.14	0.174	-0.375	0.329	-0.13	42	0.89
6	Trust1Th - Trust1En	-0.05	1.31	0.200	-0.449	0.356	-0.23	42	0.82
7	Trust2Th - Trust2En	-0.07	1.22	0.186	-0.446	0.307	-0.37	42	0.71
8	Trust3Th - Trust3En	-0.21	1.15	0.175	-0.562	0.143	-1.20	42	0.24
9	Trust4Th - Trust4En	0.12	1.10	0.167	-0.221	0.453	0.70	42	0.49
10	Trust5Th - Trust5En	-0.12	0.91	0.138	-0.395	0.162	-0.84	42	0.40
11	SocInf1Th - SocInf1En	0.12	0.70	0.106	-0.098	0.331	1.09	42	0.28
12	SocInf2Th - SocInf2En	0.26	1.09	0.167	-0.081	0.592	1.53	42	0.13
13	SocInf3Th - SocInf3En	0.28	1.10	0.167	-0.059	0.617	1.67	42	0.10
14	SocInf4Th - SocInf4En	0.07	0.63	0.096	-0.125	0.264	0.72	42	0.47
15	SocInf5Th - SocInf5En	0.07	0.63	0.096	-0.125	0.264	0.72	42	0.47
16	Soc.Pres1Th - Soc.Pres1En	0.23	0.97	0.148	-0.067	0.532	1.57	42	0.12
17	Soc.Pres2Th - Soc.Pres2En	0.07	0.51	0.077	-0.086	0.226	0.90	42	0.37
18	Soc.Pres3Th - Soc.Pres3En	-0.19	0.98	0.150	-0.488	0.116	-1.24	42	0.22
19	Soc.Pres4Th - Soc.Pres4En	0.23	1.04	0.159	-0.088	0.553	1.46	42	0.15
20	Soc.Pres5Th - Soc.Pres5En	0.35	1.34	0.205	-0.065	0.762	1.70	42	0.10

Table 5-2 illustrated the results of paired t -test during the pilot study stage in this survey. In total, there are 2 sets of questionnaires, one set is an English-language based questionnaire, and another is a translation to the Thai language questionnaire. A sample in this two set of questionnaires is the same, with the number of responses at 43 out of 200 totals contacted. From the formula of paired t -test, t value is calculated as Formula (3)

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\left(\frac{sd_{diff}}{\sqrt{n}} \right)} \quad (3)$$

Where; \bar{x}_1 is the average value of each sample in set1

\bar{x}_2 is the average value of each sample in set2

sd_{diff} is the standard deviation of the difference

n is the sample size

For instance, t value of the paired t -test between Reward1 (Thai question) and Reward 1 (English question) is:

$$\frac{0.140}{(0.639/\sqrt{43})}$$

$$= 1.431$$

In the t -test, null hypothesis (H_0) is defined as a population means are equal for the two samples, while the alternative hypothesis (H_1) is defined as a population means are not equal for the two samples (two tails).

The null hypothesis is rejected if $|T| > t_{1-\alpha/2, df}$,

Null hypothesis: $H_0: \mu_1 = \mu_2$

Alternative hypothesis: $H_1: \mu_1 \neq \mu_2$

Where the critical value of t distribution corresponding to a selected 95% confidence interval level as recommended in literatures (Samuels, 2015). And degrees of freedom (df) used in this test are: $df=n-1$, therefore $df = 43-1$

$$=42,$$

Hence, the corresponding value of t -distribution at 95 percent confidence interval ($\alpha=0.05$) and $df = 42$ can be founded in t -distribution table in Values of t -distributions for a selection of degrees of freedom and a selection of probabilities (NIST, 2020). The result of t values, as shown in Table 5-2 reveals that there is no absolute t -value higher than the corresponding value of t -distribution at $df = 42$. In opposition, the p -value is the probability of obtaining an effect at least as extreme as the one in data, assuming the truth of the null hypothesis. Therefore, to confirm that there is no difference in means between each pair of variables, the p -value of each pair of variables in Table 5-2 should greater than 0.05.

In the light of this, result from t -test in the pilot study confirm consistency between English set of questionnaires and Thai set of questionnaires. They were giving an opportunity for the researcher to continue to the survey stage with no need to revise a questionnaire.

5.3 Data screening

Data screening is a process to ensure that the data is ready to use before any additional statistical analysis is further applied. As mentioned by Gaskin (2018), the data screening process is required to guarantee that the data can be used reliably and correctly for theory testing. In this section, a demographic profile of the respondent in survey study is explained firstly, following by the discussion on five specific data screening topics including the missing data analysis, multivariate outlier, normality, linearity, and multicollinearity will be explained in section 5.3.1.2– section 5.3.1.6 respectively.

5.3.1 Demographic profile of respondents in survey study

According to a defined the number of required sample size, the sample size in this study is set at 800 based on the calculation provided in section 4.5.3.2. The sample recruitment in this survey used the combination of the probability sampling technique, which is explained in detail in section 4.5.3.3. The sample recruitment procedure was starting from the deviation of the population into stratum based on the information provided by the office of the higher education commission (OHEC) in Thailand (OHEC, 2020). Generally, the university in Thailand can be classified into large and small university based on the number of enrollment of the full-time student. A large university in their given definition is a university which has registered students over 20,000 in one academic year.

In contrast, a small university is a university which has enrolled students below 20,000. Hence, four universities from each cluster will be selected randomly through a simple random technique. These comprise of Thammasat University (TU), Mahidol University (MU), Prince of Songkla University (PSU), and Suan Sunandha Rajabhat University (SSRU) as a representative for the large university, and Thaksin University (TSU), Rajamangala University of Technology Srivijaya (RMUSV), Walailak University (WU), and Mahasarakham University (MSU) for the small university. One hundred samples per institution are recruited using a systematic random sampling technique based on the database of student number in each university. In total, 800 paper-based questionnaires were delivered to the respondent, with the total return at 746, accounted in 93.25 percent of response rate. The demographic profile of respondents is illustrated in Table

Table 5-3 Demographic background of respondents in survey study

Characteristics		N	Freq.
Gender	Male	285	38%
	Female	461	62%
Year of study	1	197	26%
	2	186	25%
	3	171	23%
	4	164	22%
	5+	28	4%
University	Thammasat University (TU)	95	13%
	Mahidol University (MU)	93	12%
	Prince of Songkla University (PSU)	96	13%
	Thaksin University (TSU)	93	12%
	Suan Sunandha Rajabhat University (SSRU)	88	12%
	Rajamangala University of Technology Srivijaya (RMUSV)	96	13%
	Walailak University (WU)	91	12%
	Maharakham University (MSU)	94	13%
Area of study	Accounting	50	7%
	Agricultural	37	5%
	Business and management	71	10%
	Dentistry	23	3%
	Economics	58	8%
	Education	46	6%
	Engineering	55	7%
	Fine, Applied Arts, and Architectures	19	3%
	Humanities	41	5%
	Journalism and Mass Communication	32	4%
	Law	23	3%
	Logistics and supply chain management	44	6%
	Medicine and nursing	12	2%
	Pharmaceutical Medicine	15	2%
	Political Science	46	6%
	Science	79	11%
	Social Science	66	9%
	Veterinary Medicine	29	4%

From Table 5-3, based on the total returned questionnaires in the data collection stage, 746 respondents were classified into four main characteristics, including gender, year of study, university, and their area of study. In Table 5-3, N refers to the number of samples in each criterion, and freq. refer to the frequency of each criterion compare to the total sample size for each category. Hence, the total frequency of each category will be 100

percent, and the total sample size must equal to 746. To understand clearly, each category of respondent's will be illustrated and explained in Figure 5-2 to Figure 5-5

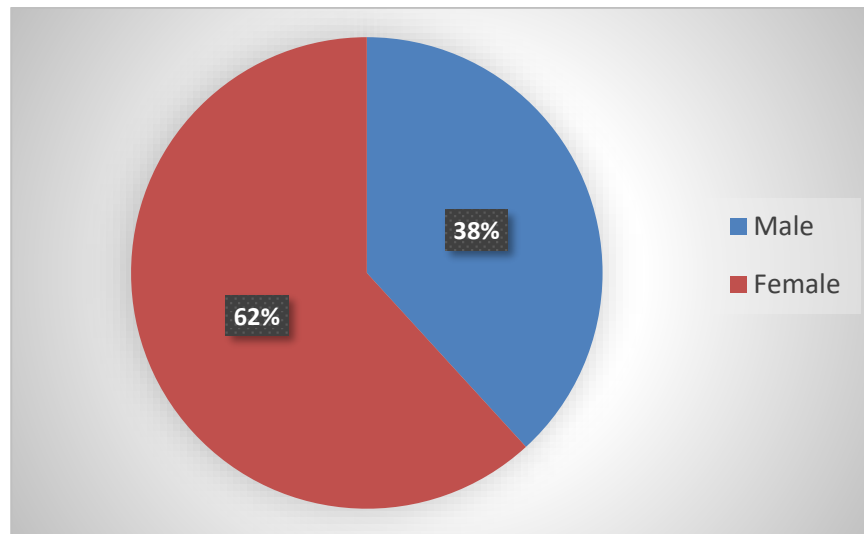


Figure 5-2 A classification of respondent's information based on gender

As illustrated in Figure 5-2, the majority of the respondents are female (62%), and above one-third of the respondents (38%) are male. This is because the number of female university student is almost double of the male university student. For example, a statistic in PSU (Hatyai campus) indicated that the number of female students in the academic year of 2019 was 9,335, while male students were 5,371 (reg.psu, 2020).

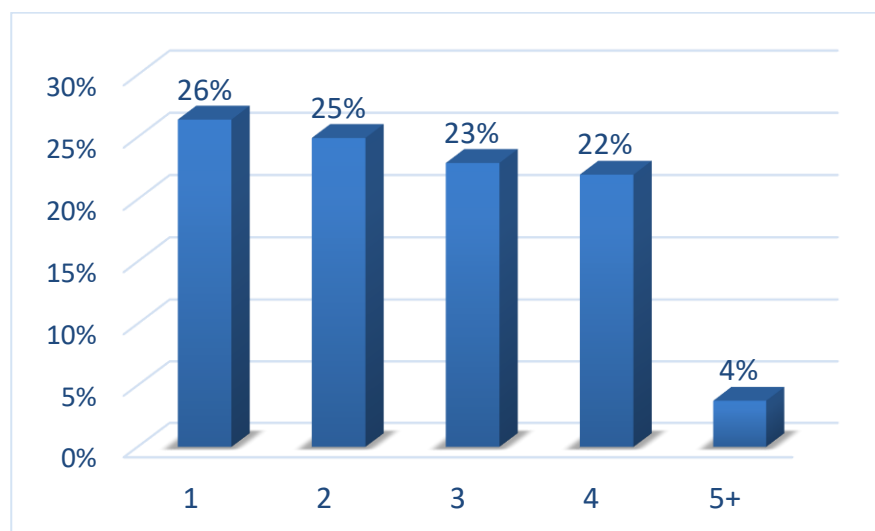


Figure 5-3 A classification of respondent's information based on Year of study

As shown in Figure 5-3, the percentage of participants regarding the year of study is about the same for year 1-4, range from 26 percent in year 1 to 25, 23, and 22 percent in year 4. This is because, in the sample recruitment procedure, samples are selected based on a

systematic random sampling technique. Hence, the number of participants in each year should be about the same. However, there is an exception to the participant in year 5+ as it indicates the lowest frequency of participant at 4%. This is because most of the teaching course in Thailand for the undergraduate student is 4 years, except for a few areas of study such as faculty of architectures (5 years), and faculty of medicine (6 years).

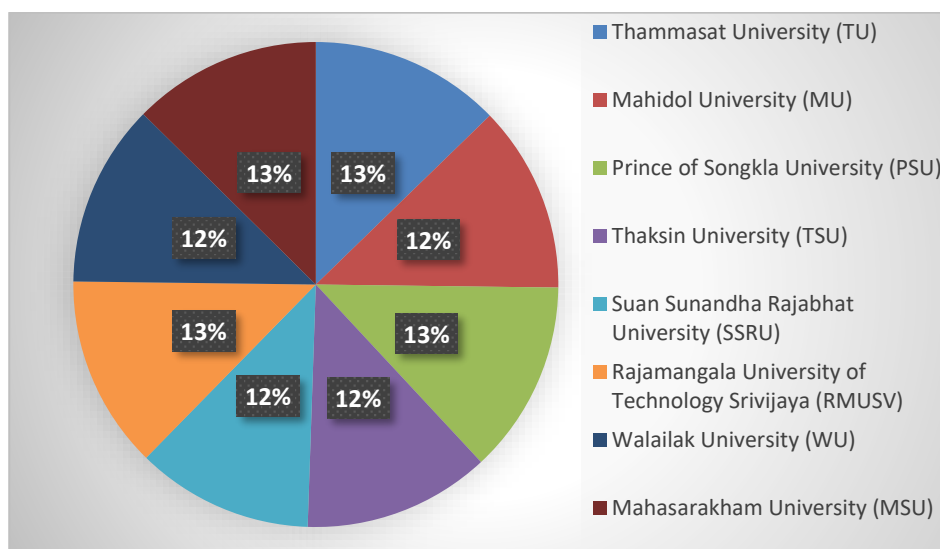


Figure 5-4 A classification of respondent's information based on University of study

As displayed in Figure 5-4, the proportion of respondent's information based on the university of study is approximately the same around 12-13 percent for every university. This is because the number of required samples are divided into the same number in cluster sampling stage for every university, consist of TU, MU, PSU, TSU, SSRU, RMUSV, WU, and MSU.

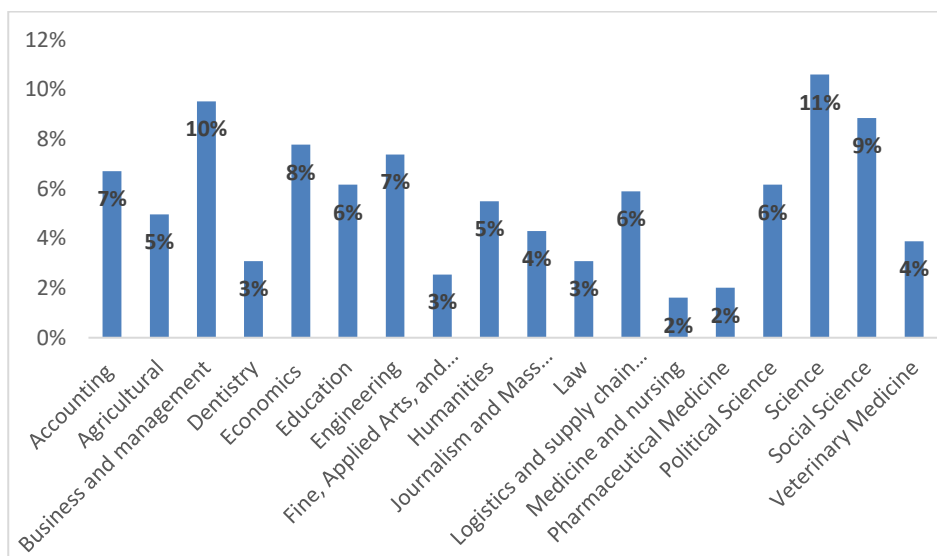


Figure 5-5 A classification of respondent's information based on area of study

As illustrated in Figure 5-5, area of study in this survey are divided into 18 areas, and the highest percentage of participants study in the area of science, business and management, and social science with the frequency at 11, 10, and 9 percent respectively. The lowest percentage of participants study in the area of medicine and nursing and pharmaceutical science. This is because these two faculty are running in some of the university in the list (MU, TU, PSU, and WU).

5.3.2 Missing data analysis results

Missing data is a case where the valid value on at least one variable is missed, and it is not able for data analysis (Hair et al., 2014). As determined the process of missing data in section 4.6.2.1, the missing data will be managed through the selected remedies method. To justify the data imputation method or missing data management, descriptive analysis of the missing data will be illustrated in Table 5-4

As illustrated in Table 5-4, from the total returned at 746 sets of questionnaires, two of the questionnaires were returned with no answer in every question. Some of them are not willing to continue to complete the questionnaire as it can be seen from question 13 (Soc Inf 3); the number of respondents started to drop from 744 to 740. Moreover, from this point, there are some missing data occur in every variable, with the highest number of missing data in Consump5 and Affect.1 at the level of missing data is 12 cases. The total complete data in this study are 708 cases.

As determined earlier that to use only complete data if the percentage of missing cases less than 10 percent and the dataset is large enough (Gaskin, 2018; Hair et al., 2014). This is to reduce bias in missing data imputation process (Prasitwattanaseri & Prasitwattanaseri, 2006). In this study, the percentage of missing cases compare to total cases are approximately 5 percent, therefore, the imputation using listwise data deletion which is a way to deal with missing data by do not pay attention to the data that contains a missing value, hence, only 708 completed data will be further analysed in this survey.

Table 5-4 Descriptive statistics of missing data

Variables	N	Min	max	Mean	Std. Deviation
Reward1	744	1	7	4.78	1.352
Reward2	744	1	7	4.49	1.199
Reward3	744	1	7	4.72	1.243
Reward4	744	1	7	4.68	1.283
Reward5	744	1	7	4.86	1.314
Trust1	744	1	7	3.80	1.368
Trust2	744	1	7	4.06	1.376
Trust3	744	1	7	3.87	1.329
Trust4	744	1	7	3.99	1.370
Trust5	744	1	7	5.41	1.379
SocInf1	744	1	7	4.70	1.340
SocInf2	744	1	7	4.41	1.291
SocInf3	740	1	7	4.55	1.166
SocInf4	740	1	7	4.56	1.224
SocInf5	740	1	7	4.65	1.290
Soc.Pres1	739	1	7	4.60	1.447
Soc.Pres2	738	1	7	4.39	1.448
Soc.Pres3	738	1	7	4.36	1.504
Soc.Pres4	740	1	7	3.85	1.563
Soc.Pres5	740	1	7	4.26	1.566
Cog.2	740	1	7	6.49	0.993
Cog.3	738	1	7	6.36	1.029
Cog.4	735	1	7	6.54	0.916
Cog.5	736	1	7	5.58	1.298
Affect.1	734	1	7	5.43	1.543
Affect.2	736	1	7	5.30	1.591
Affect.3	735	1	7	5.38	1.502
Affect.4	737	1	7	5.29	1.571
Affect.5	735	1	7	5.71	1.419
Conat.1	737	1	7	5.35	1.396
Conat.2	737	1	7	5.30	1.359
Conat.3	736	1	7	5.14	1.310
Conat.4	737	1	7	5.04	1.325
Conat.5	737	1	7	4.67	1.261
Consump.1	737	1	7	4.60	1.186
Consump.2	737	1	7	4.42	1.250
Consump.3	737	1	7	4.66	1.258
Consump.4	737	1	7	4.31	1.317
Consump.5	734	1	7	4.24	1.405
Contrib.1	737	1	7	2.92	1.479
Contrib.2	737	1	7	2.88	1.490
Contrib.3	737	1	7	2.83	1.442
Contrib.4	737	1	7	3.38	1.508
Contrib.5	737	1	7	4.09	1.464
Creat.1	736	1	7	2.21	1.411
Creat.2	736	1	7	2.35	1.431
Creat.3	736	1	7	2.33	1.436
Creat.4	736	1	7	2.15	1.417
Creat.5	737	1	7	2.07	1.423
Valid N (listwise)	708				

5.3.3 Multivariate outlier results

A multivariate outlier is a combination of unusual scores on at least two variables. Both types of outliers can influence the outcome of statistical analyses. In this study, the author employs Cook's distance methods, which provide an overall measure of the impact of an observation on the estimated regression coefficient is applied as it can visualizer shows a stem plot of all instances by index and their associated distance score. The author will follow the cut-off value of Cook's distance at 1 for item deletion as recommended by Gaskin (2018). Results from the Cook's distance is displayed in figure 5-6

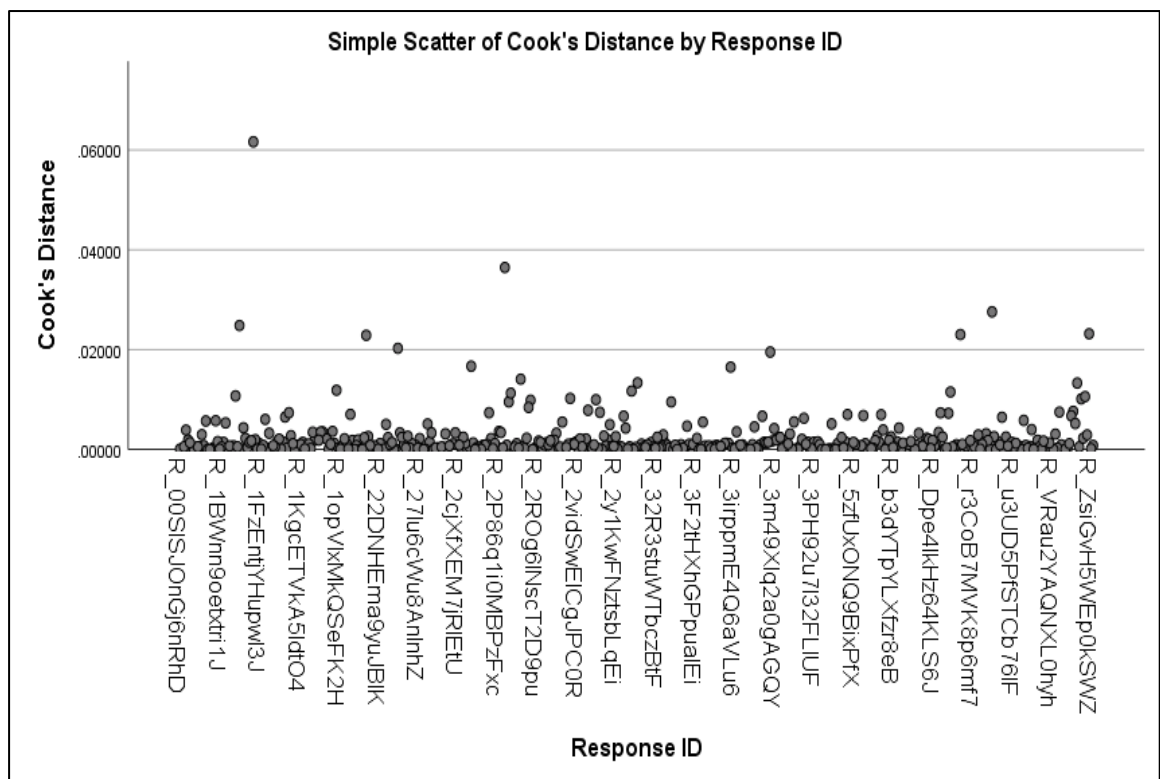


Figure 5-6 Cook's distance by response ID between independent variable onto contribution (dependent variable)

Cook's distance is the scaled change in fitted values, which is useful for identifying outliers in the X values (observations for predictor variables). Cook's distance shows the influence of each observation on the fitted response values. In this study, observation with Cook's distance more significant than one will be removed. Each element in the Cook's distance is the normalized change in the fitted response values due to the deletion of an observation. The Cook's distance of observation i is calculated as Formula (4)

$$D_i = \frac{\sum_{j=1}^n (\hat{y}_j - \hat{y}_{j(i)})^2}{pMSE} \quad (4)$$

Where; \hat{y}_j is the j th fitted response value.

$\hat{y}_j(i)$ is the j th fitted response value, where the fit does not include observation i .

MSE is the mean squared error.

p is the number of coefficients in the regression model.

And Cook's distance is algebraically equivalent to the following expression (5):

$$D_i = \frac{r_i^2}{pMSE} \left(\frac{h_{ii}}{(1-h_{ii}^2)} \right) \quad (5)$$

Where; r_i is the i th residual, and h_{ii} is the i th leverage value.

However, in this study, a calculation of cook distance is provided in SPSS version 26, and a graphical display of the Cook's distance by response ID between independent variable onto dependent variable, for example, consumption variable, is illustrated as in Figure 5-6. The result from Cook's distance reveals that there is no such a single response has a value of Cook's distance more massive than 1.

Therefore, the 708 valid response from the missing data analysis stage is remaining the same amount, without any further case deletion required.

5.3.4 Normality results

In statistics, normality tests are used to determine whether a data set is modelled for normal distribution. Many statistical functions require that a distribution be normal or nearly normal. There are both graphical (histogram and normality plot) and statistical methods for evaluating normality. However, to test a normality of data in this study, a statistical method, which is skewness and kurtosis is applied. Skewness refers to the shape of a unimodal distribution that is not symmetrical with the mean. In statistics, skewness is a measure of the asymmetry of the probability distribution of a random variable about its mean. While, Kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution. Results of skewness and kurtosis test is illustrated in Table 5-5

Table 5-5 Skewness and Kurtosis result

Variable	N		Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing				
Reward1	708	0	-0.369	0.092	-0.206	0.183
Reward2	708	0	-0.132	0.092	-0.054	0.183
Reward3	708	0	-0.289	0.092	-0.076	0.183
Reward4	708	0	-0.058	0.092	-0.303	0.183
Reward5	708	0	-0.286	0.092	-0.384	0.183
Trust1	708	0	0.105	0.092	-0.273	0.183
Trust2	708	0	-0.003	0.092	-0.268	0.183
Trust3	708	0	0.049	0.092	-0.063	0.183
Trust4	708	0	-0.021	0.092	-0.385	0.183
Trust5	708	0	-0.740	0.092	0.018	0.183
SocInf1	708	0	-0.129	0.092	-0.195	0.183
SocInf2	708	0	-0.122	0.092	-0.015	0.183
SocInf3	708	0	-0.100	0.092	0.141	0.183
SocInf4	708	0	-0.134	0.092	0.059	0.183
SocInf5	708	0	-0.101	0.092	-0.045	0.183
Soc.Pres1	708	0	-0.490	0.092	-0.202	0.183
Soc.Pres2	708	0	-0.292	0.092	-0.328	0.183
Soc.Pres3	708	0	-0.386	0.092	-0.447	0.183
Soc.Pres4	708	0	0.005	0.092	-0.596	0.183
Soc.Pres5	708	0	-0.239	0.092	-0.579	0.183
Cog.1	708	0	-1.890	0.092	-0.823	0.183
Cog.2	708	0	-1.682	0.092	0.325	0.183
Cog.3	708	0	-1.133	0.092	1.137	0.183
Cog.4	708	0	-1.125	0.092	1.534	0.183
Cog.5	708	0	-1.011	0.092	0.786	0.183
Affect.1	708	0	-0.775	0.092	-0.185	0.183
Affect.3	708	0	-0.892	0.092	0.071	0.183
Affect.3	708	0	-0.903	0.092	0.190	0.183
Affect.4	708	0	-0.894	0.092	0.149	0.183
Affect.5	708	0	-1.208	0.092	0.889	0.183
Conat.1	708	0	-0.713	0.092	0.187	0.183
Conat.2	708	0	-0.642	0.092	0.003	0.183
Conat.3	708	0	-0.306	0.092	-0.366	0.183
Conat.4	708	0	-0.292	0.092	-0.227	0.183
Conat.5	708	0	-0.008	0.092	-0.045	0.183
Consump.1	708	0	-0.227	0.092	0.233	0.183
Consump.2	708	0	-0.287	0.092	0.038	0.183
Consump.3	708	0	-0.366	0.092	0.066	0.183
Consump.4	708	0	-0.232	0.092	-0.116	0.183
Consump.5	708	0	-0.283	0.092	-0.347	0.183
Contrib.1	708	0	0.468	0.092	-0.529	0.183
Contrib.2	708	0	0.469	0.092	-0.500	0.183
Contrib.3	708	0	0.380	0.092	-0.736	0.183
Contrib.4	708	0	0.193	0.092	-0.552	0.183
Contrib.5	708	0	-0.144	0.092	-0.385	0.183
Creat.1	708	0	1.102	0.092	0.604	0.183
Creat.2	708	0	0.834	0.092	-0.249	0.183
Creat.3	708	0	0.949	0.092	0.205	0.183
Creat.4	708	0	1.155	0.092	0.514	0.183
Creat.5	708	0	1.328	0.092	1.100	0.183

Total 50 variables are being checked the normality of data by performing a skewness and kurtosis test. Data from 708 valid response without any missing data are calculated to provide skewness and kurtosis for each variable. As mentioned earlier in section 4.6.2.3, a cut-off value for this study is set as between -2 to +2, and the result in Table 5-5 reveals that there is no such a skewness and kurtosis exceed the cut-off value in all of variables. Therefore, it could sum up that the data in this survey distributes as a normal distribution.

5.3.5 Linearity results

Linearity refers to the consistent slope of change that represents the relationship between independent variables (IV) and dependent variables (DV). If the relationship between IV and DV is entirely inconsistent, it will affect SEM analysis which required to use a data transformation to deal with these nonlinearities which involve the changing the metric for either X-axis or Y-axis. There are both graphical (simple scatter plot) and statistical methods for evaluating linearity. However, to test linearity of data in this study, a deviation from linearity test available in the ANOVA test in SPSS will be used, if the significant value for deviation from linearity is less than 0.05, hence, the relationship between IV and DV is not linear. Results of the significant value for deviation from linearity between IV and DV as an example of Reward (IV) and Contribution, and Creation as (DV) will be illustrated in Table 5-6.

Table 5-6 Significant value for deviation from IV and DV

Deviation from Linearity between group	Sum of Squares	df	Mean Square	F	Sig.	Deviation from Linearity between group	Sum of Squares	df	Mean Square	F	Sig.
Contrib.1 * Reward1	10.405	5	2.081	0.938	0.456	Creat.1 * Reward3	8.210	5	1.642	0.803	0.548
Contrib.2 * Reward1	14.621	5	2.924	1.297	0.263	Creat.2 * Reward3	6.335	5	1.267	0.596	0.703
Contrib.3 * Reward1	5.455	5	1.091	0.516	0.764	Creat.3 * Reward3	15.999	5	3.200	1.522	0.181
Contrib.4 * Reward1	16.570	5	3.314	1.460	0.201	Creat.4 * Reward3	5.825	5	1.165	0.556	0.734
Contrib.5 * Reward1	11.096	5	2.219	1.053	0.385	Creat.5 * Reward3	1.234	5	0.247	0.115	0.989
Creat.1 * Reward1	1.181	5	0.236	0.115	0.989	Contrib.1 * Reward4	16.970	5	3.394	1.468	0.198
Creat.2 * Reward1	5.573	5	1.115	0.526	0.757	Contrib.2 * Reward4	14.631	5	2.926	1.449	0.205
Creat.3 * Reward1	5.278	5	1.056	0.499	0.777	Contrib.3 * Reward4	16.378	5	3.276	1.513	0.183
Creat.4 * Reward1	13.259	5	2.652	1.272	0.274	Contrib.4 * Reward4	16.951	5	3.390	1.482	0.193
Creat.5 * Reward1	11.624	5	2.325	1.092	0.363	Contrib.5 * Reward4	15.514	5	3.103	1.466	0.199
Contrib.1 * Reward2	13.827	5	2.765	1.266	0.277	Creat.1 * Reward4	8.114	5	1.623	0.799	0.551
Contrib.2 * Reward2	16.405	5	3.281	1.469	0.198	Creat.2 * Reward4	19.813	5	3.963	1.885	0.095
Contrib.3 * Reward2	12.955	5	2.591	1.245	0.286	Creat.3 * Reward4	16.544	5	3.309	1.569	0.167
Contrib.4 * Reward2	15.652	5	3.130	1.374	0.232	Creat.4 * Reward4	15.639	5	3.128	1.502	0.187
Contrib.5 * Reward2	7.443	5	1.489	0.700	0.623	Creat.5 * Reward4	16.526	5	3.305	1.557	0.170
Creat.1 * Reward2	13.989	5	2.798	1.386	0.227	Contrib.1 * Reward5	11.189	5	2.238	1.017	0.406
Creat.2 * Reward2	23.030	5	4.606	2.204	0.052	Contrib.2 * Reward5	6.884	5	1.377	0.611	0.691
Creat.3 * Reward2	12.526	5	2.505	1.188	0.313	Contrib.3 * Reward5	8.476	5	1.695	0.807	0.545
Creat.4 * Reward2	15.777	5	3.155	1.521	0.181	Contrib.4 * Reward5	6.075	5	1.215	0.529	0.755
Creat.5 * Reward2	17.092	5	3.418	1.623	0.152	Contrib.5 * Reward5	10.317	5	2.063	0.970	0.435
Contrib.1 * Reward3	6.106	5	1.221	0.548	0.740	Creat.1 * Reward5	2.556	5	0.511	0.249	0.940
Contrib.2 * Reward3	7.005	5	1.401	0.618	0.686	Creat.2 * Reward5	2.088	5	0.418	0.196	0.964
Contrib.3 * Reward3	5.593	5	1.119	0.528	0.755	Creat.3 * Reward5	9.487	5	1.897	0.893	0.485
Contrib.4 * Reward3	5.922	5	1.184	0.518	0.763	Creat.4 * Reward5	11.455	5	2.291	1.098	0.360
Contrib.5 * Reward3	8.133	5	1.627	0.731	0.600	Creat.5 * Reward5	12.378	5	2.476	1.162	0.327

From Table 5-6, it can be seen that there is no significant value for deviation from linearity is less than 0.05. Hence, it can be concluded that there is no problem from non-linearity occurs in this study.

5.3.6 Multicollinearity results

Multicollinearity refers to a situation in which two or more explanatory variables in a multiple regression model are highly linearly related. This correlation causes a problem because independent variables should be independent, so the degree of correlation between variables should not be high. To check this is to calculate a Variable Inflation Factor (VIF) for each independent variable after running a multivariate regression. The rules of thumb for the VIF proposed by (Gaskin, 2018) that if the VIF value is more than 5 and tolerance level is less than 0.1, it is very likely to cause a problem. Hence, it is required to drop the problematic value out. Results of multicollinearity test by considering VIF is displayed in Table 5-7

Table 5-7 Variable inflation factor (VIF) for independent variable

	Unstandardized Coefficients Beta	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
						Tolerance	VIF
Cog.1	-0.018	0.069	-0.014	-0.263	0.793	0.602	1.661
Cog.2	-0.011	0.084	-0.008	-0.132	0.895	0.463	2.159
Cog.3	-0.192	0.086	-0.136	-2.229	0.026	0.471	2.121
Cog.4	0.010	0.091	0.006	0.110	0.912	0.540	1.851
Cog.5	0.008	0.042	0.008	0.185	0.853	0.855	1.170
Affect.1	-0.015	0.044	-0.016	-0.350	0.726	0.853	1.173
Affect.2	0.119	0.047	0.112	2.521	0.012	0.855	1.170
Affect.3	0.020	0.051	0.023	0.388	0.698	0.521	1.919
Affect.4	-0.137	0.063	-0.149	-2.175	0.030	0.375	2.667
Affect.5	-0.085	0.069	-0.094	-1.227	0.220	0.301	3.318
Conat.1	0.032	0.057	0.035	0.554	0.580	0.432	2.316
Conat.2	0.010	0.054	0.011	0.181	0.856	0.455	2.200
Conat.3	0.085	0.059	0.090	1.429	0.154	0.444	2.251
Conat.4	-0.041	0.063	-0.042	-0.647	0.518	0.415	2.407
Conat.5	0.091	0.060	0.091	1.520	0.129	0.493	2.030
Reward1	0.056	0.064	0.064	0.878	0.380	0.333	3.007
Reward2	0.050	0.061	0.051	0.830	0.407	0.463	2.160
Reward3	-0.046	0.062	-0.051	-0.747	0.455	0.376	2.659
Reward4	0.052	0.062	0.054	0.842	0.400	0.420	2.380
Reward5	-0.004	0.055	-0.004	-0.071	0.943	0.487	2.054
Trust1	0.084	0.057	0.092	1.481	0.139	0.458	2.184
Trust2	0.033	0.056	0.037	0.598	0.550	0.450	2.224
Trust3	0.019	0.071	0.021	0.272	0.786	0.302	3.316
Trust4	0.042	0.066	0.047	0.630	0.529	0.319	3.135
Trust5	-0.093	0.043	-0.105	-2.190	0.029	0.759	1.317
SocInf1	0.033	0.081	0.033	0.411	0.681	0.273	3.659
SocInf2	0.136	0.090	0.130	1.510	0.132	0.238	4.209
SocInf3	-0.025	0.090	-0.024	-0.279	0.780	0.230	4.351
SocInf4	0.073	0.087	0.070	0.846	0.398	0.256	3.909
SocInf5	0.236	0.060	0.178	3.928	0.000	0.821	1.218

As seen in Table 5-7, there is no VIF values exceed 5. Hence, this confirm that it has no multicollinearity problem in this study. From all above data screening, 708 responses are confirmed to be further analysed in the next section.

5.4 Results of constructs testing using Exploratory Factor analysis (EFA)

Following the pilot study and data screening process, the construct was tested using EFA to calibrate and revise for the measurement model. In this study, the initial model comprises of 50 variables. In this step, the Statistical Package for the Social Sciences (SPSS) version 26 was employed to test the EFA. Results of each EFA criteria will be discussed in section 5.4.1 to section 5.4.5

5.4.1 KMO and Bartlett's test results

Kaiser-Meyer-Olkin (KMO) is a test of sampling adequacy showing the proportion of variation in variables that may be caused by underlying values. The high value of KMO (close to 1) indicates that the data are suitable to perform factor analysis however, as mentioned earlier in section 4.6.3.3 that the cut-off value for KMO in this study is set at 0.7. While, Bartlett's test of sphericity tests whether a proposed correlation matrix is an identity matrix or not, which identity matrix indicates that variables are unrelated. Significance level at below 0.005 indicates that factor analysis is useful with the data. Results of KMO and Bartlett's test is provided in Table 5-8

Table 5-8 KMO and Bartlett's results in three model of EFA

Model		1	2	3
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.818	0.820	0.809
Bartlett's Test of Sphericity	Approx. Chi-Square	9920.549	9286.935	8905.724
	df	1225	903	820
	Sig.	0.000	0.000	0.000

Table 5-8 gives the results of KMO and Bartlett's test for the three models in EFA. Model 1 is an initial model which comprises of 50 variables based on the construct development of existing works of literature. However, after processing through a communalities results in section 5.4.2, 7 items were removed because they generate communalities below the cut-off value which has been set for this study. The removing of items leads to the

generation of model 2, and after processing through the model validity and reliability in section 5.4.3, 2 more items were also removed. This comes to the third model, which are the final model for the EFA in this study.

As seen from table 5-8, results of KMO in every model are higher than the cut-off values at 0.818, 0.820, and 0.809 for model 1, 2, and 3, respectively. While the significant level in Bartlett's test of sphericity in every model is below 0.005; therefore, a null hypothesis that a proposed correlation matrix is an identity matrix is rejected.

In light of these, results from KMO and Bartlett's test indicate the evidence that there is a functional interrelationship between constructs in this study. Hence, it will conclude that the variables in this study are correlated highly enough to provide a reasonable basis for factor analysis.

5.4.2 Communalities results

Communalities is the proportion of each variable's variance that can be explained by the factors (e.g., the underlying latent continua). As highlighted in section 4.6.3.4 that a cut-off communality in this study will follow the recommendation of Gaskin (2018) as to remove items with a low communality value (<0.4). Results of communality values for the initial model is shown in Table 5-9

Table 5-9 Communalities results for variables in an initial model of this study

Communalities					
	Initial	Extraction		Initial	Extraction
Reward1	0.85	0.745	Affect.1	0.38	0.217
Reward2	0.86	0.799	Affect.2	0.767	0.833
Reward3	0.897	0.903	Affect.3	0.469	0.292
Reward4	0.867	0.853	Affect.4	0.76	0.783
Reward5	0.39	0.33	Affect.5	0.673	0.582
Trust1	0.908	0.895	Conat.1	0.295	0.178
Trust2	0.966	0.999	Conat.2	0.415	0.249
Trust3	0.928	0.924	Conat.3	0.558	0.562
Trust4	0.878	0.855	Conat.4	0.534	0.486
Trust5	0.367	0.241	Conat.5	0.55	0.622
Soc.Inf1	0.794	0.652	Consump.1	0.656	0.55
Soc.Inf2	0.621	0.582	Consump.2	0.798	0.759
Soc.Inf3	0.786	0.639	Consump.3	0.749	0.781
Soc.Inf4	0.828	0.726	Consump.4	0.747	0.732
Soc.Inf5	0.778	0.589	Consump.5	0.737	0.72
Soc.Pres1	0.871	0.915	Contrib.1	0.818	0.817
Soc.Pres2	0.647	0.606	Contrib.2	0.772	0.756
Soc.Pres3	0.867	0.879	Contrib.3	0.835	0.892
Soc.Pres4	0.696	0.583	Contrib.4	0.651	0.545
Soc.Pres5	0.58	0.447	Contrib.5	0.605	0.5
Cog.1	0.581	0.531	Creat.1	0.773	0.782
Cog.2	0.713	0.824	Creat.2	0.803	0.859
Cog.3	0.641	0.662	Creat.3	0.807	0.81
Cog.4	0.555	0.516	Creat.4	0.833	0.917
Cog.5	0.315	0.203	Creat.5	0.828	0.822

From all 50 variables in this study in Table 5-9, there are seven items which provide communality value below the cut-off value at 0.4. These 7 items including Reward5, Trust 5, Cog.5, Affect.1, Affect. 3, Conat.1, and Conat.2 with the communality value at 0.330, 0.241, 0.203, 0.217, 0.292, 0.178, and 0.249. If the communality is low, this suggests that the variable has little in common with the other variables and is likely a target for elimination. Therefore, the removal of these seven items is performed, and the communalities value after deleting these low-communality items (2nd model) is illustrated in Table 5-10

Table 5-10 Communalities results after deleted 7 items (2nd model)

Communalities					
	Initial	Extraction		Initial	Extraction
Reward1	0.845	0.75	Affect.2	0.76	0.898
Reward2	0.855	0.798	Affect.4	0.742	0.745
Reward3	0.892	0.904	Affect.5	0.608	0.544
Reward4	0.864	0.852	Conat.3	0.479	0.496
Trust1	0.906	0.893	Conat.4	0.497	0.589
Trust2	0.965	0.999	Conat.5	0.522	0.53
Trust3	0.927	0.913	Consump.1	0.648	0.543
Trust4	0.871	0.841	Consump.2	0.787	0.765
Soc.Inf1	0.788	0.644	Consump.3	0.743	0.777
Soc.Inf2	0.606	0.578	Consump.4	0.733	0.726
Soc.Inf3	0.777	0.641	Consump.5	0.73	0.721
Soc.Inf4	0.823	0.725	Contrib.1	0.813	0.823
Soc.Inf5	0.774	0.588	Contrib.2	0.764	0.759
Soc.Pres1	0.865	0.916	Contrib.3	0.825	0.884
Soc.Pres2	0.637	0.606	Contrib.4	0.647	0.53
Soc.Pres3	0.864	0.877	Contrib.5	0.597	0.495
Soc.Pres4	0.672	0.583	Creat.1	0.769	0.756
Soc.Pres5	0.555	0.445	Creat.2	0.796	0.794
Cog.1	0.562	0.545	Creat.3	0.8	0.814
Cog.2	0.697	0.783	Creat.4	0.821	0.775
Cog.3	0.619	0.672	Creat.5	0.823	0.782
Cog.4	0.529	0.512			

As seen in Table 5-10, after delete seven items which have low communality values provided in Table 5-9, all 43 remaining items have communalities above the cut-off value at 0.4. Therefore, all 43 variables will be used in the next step of EFA, which is the determination of factor structure, which will be further analysed in section 5.4.3

5.4.3 Factor structure results

A factor structure is a correlational relationship between variables that are being tested at a particular construct in EFA. Generally, there are two main things to be considered in factor structure. The first one is to explore if there is a significant cross-loading between factors or not, and the last one is to observe the low loading value as it will affect convergent validity of EFA. Table 5-11 shows the pattern matrix of the remaining 43 variables in this study, and the analysis of results will be explained further.

Table 5-11 initial Pattern matrix of EFA in this study

Variables	1	2	3	4	5	6	7	8	9	10
Reward1					0.850					
Reward2					0.888					
Reward3					0.941					
Reward4					0.926					
Trust1			0.940							
Trust2			0.995							
Trust3			0.956							
Trust4			0.907							
Soc.Inf1						0.756				
Soc.Inf2						0.761				
Soc.Inf3						0.738				
Soc.Inf4						0.861				
Soc.Inf5						0.748				
Soc.Pres1				0.981						
Soc.Pres2				0.733						
Soc.Pres3				0.938						
Soc.Pres4				0.722						
Soc.Pres5				0.587						
Cog.1							0.723			
Cog.2							0.895			
Cog.3							0.797			
Cog.4							0.679			
Affect.2								0.972		
Affect.4								0.859		
Affect.5								0.679		
Conat.3										0.652
Conat.4										0.768
Conat.5										0.669
Consump.1	0.699									
Consump.2	0.885									
Consump.3	0.920									
Consump.4	0.865									
Consump.5	0.820									
Contrib.1									0.877	
Contrib.2									0.837	
Contrib.3									0.932	
Contrib.4	0.322								0.405	
Contrib.5	0.255								0.539	
Creat.1		0.875								
Creat.2		0.881								
Creat.3		0.891								
Creat.4		0.870								
Creat.5		0.858								

Results of pattern matrix in Table 5-11 indicate that there are ten possible constructs in this study including, Consumption1-5 are loading to construct number 1, Creation 1-5 are loading to construct number 2, Trust1-4 are loading to construct number 3, Soc.Press1-5 are loading to construct number4, and Reward 1-4 are loading to construct number 5, SocInf. 1-5 are loading to construct number 6, Cog.1-4 are loading to construct number 7, Affect.2,4, and five are loading to construct number8, Contrib. 1-3 are loading to construct number 9 and Conat. 3-5 are loading to construct number 10. All these variables are loading into one construct except for Contrib. 4-5, which both are loading into construct number 1 and 9. This can be explained that question 4-5 in contribution item have somehow similar or not have a distinct meaning which might affect to the confusion of participants. Hence, these two items were removed, and the result of the pattern matrix after deleting these two items will be generated in Table 5-12

Results of pattern matrix in Table 5-12 show that there 41 variables are loading into ten constructs in this study. This is in line with the theoretical model, as the author proposed a model with ten constructs. The distribution of items and constructs are as follow: Creation 1-5 are loading to construct number 1 Trust1-4 are loading to construct number 2, Consumption1-5 are loading to construct number 3, Soc.Press1-5 are loading to construct number4; Reward 1-4 are loading to construct number 5, SocInf. 1-5 are loading to construct number 6, Cog.1-4 are loading to construct number 7, Affect.2,4, and five are loading to construct number8, Contrib. 1-3 are loading to construct number 9 and Conat. 3-5 are loading to construct number 10. All these variables are loading into one construct, and the loading ranges between 0.588 for Soc.Press.5 and 0.997 for Trust number 2. These factor loading values are higher than a recommended threshold of factor loading value at 0.5. And per cent of total variance explained based on the eigenvalues criteria is shown in Table 5-13

Table 5-13 illustrates total variances which are divided into ten possible factors because of the use of principal component analysis. During the selection of factor extraction option in SPSS as “Based on eigenvalue and eigenvalue greater than one” criteria, meaning that the factor should explain more than a single item would have explained.

Table 5-12 Pattern matrix of EFA after removing Contrib. 4, and 5 in this study

Variables	1	2	3	4	5	6	7	8	9	10
Reward1					0.852					
Reward2					0.889					
Reward3					0.941					
Reward4					0.929					
Trust1		0.941								
Trust2		0.997								
Trust3		0.958								
Trust4		0.909								
Soc.Inf1						0.756				
Soc.Inf2						0.760				
Soc.Inf3						0.738				
Soc.Inf4						0.860				
Soc.Inf5						0.747				
Soc.Pres1				0.985						
Soc.Pres2				0.735						
Soc.Pres3				0.941						
Soc.Pres4				0.724						
Soc.Pres5				0.588						
Cog.1							0.721			
Cog.2							0.898			
Cog.3							0.798			
Cog.4							0.679			
Affect.2								0.975		
Affect.4								0.851		
Affect.5								0.676		
Conat.3										0.666
Conat.4										0.758
Conat.5										0.682
Consump.1			0.688							
Consump.2			0.864							
Consump.3			0.901							
Consump.4			0.836							
Consump.5			0.791							
Contrib.1									0.870	
Contrib.2									0.826	
Contrib.3									0.910	
Creat.1	0.863									
Creat.2	0.870									
Creat.3	0.878									
Creat.4	0.862									
Creat.5	0.852									

Table 5-13 Total variance explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.373	20.423	20.423	4.206	10.258	10.258	5.775
2	6.065	14.793	35.216	7.636	18.624	28.882	4.155
3	3.360	8.196	43.412	4.417	10.773	39.655	5.169
4	3.187	7.773	51.185	2.625	6.403	46.058	4.714
5	2.811	6.856	58.041	3.311	8.075	54.133	4.233
6	2.226	5.429	63.469	1.755	4.279	58.413	4.283
7	2.004	4.888	68.358	1.942	4.737	63.150	3.780
8	1.878	4.581	72.938	1.786	4.355	67.505	3.596
9	1.443	3.519	76.457	1.046	2.552	70.057	5.402
10	1.133	2.764	79.221	1.078	2.628	72.685	2.689
11	0.715	1.744	80.964				
12	0.653	1.593	82.557				
13	0.576	1.405	83.962				
14	0.550	1.342	85.304				
15	0.496	1.209	86.514				
16	0.455	1.109	87.623				
17	0.434	1.057	88.681				
18	0.401	0.977	89.658				
19	0.389	0.948	90.606				
20	0.372	0.908	91.514				
21	0.345	0.841	92.355				
22	0.319	0.777	93.132				
23	0.285	0.694	93.826				
24	0.282	0.687	94.513				
25	0.242	0.591	95.104				
26	0.216	0.527	95.631				
27	0.209	0.509	96.140				
28	0.183	0.447	96.587				
29	0.181	0.442	97.029				
30	0.167	0.407	97.436				
31	0.158	0.386	97.822				
32	0.140	0.342	98.164				
33	0.131	0.321	98.485				
34	0.120	0.292	98.777				
35	0.115	0.279	99.056				
36	0.100	0.244	99.301				
37	0.074	0.179	99.480				
38	0.071	0.174	99.654				
39	0.064	0.155	99.810				
40	0.053	0.130	99.940				
41	0.025	0.060	100.000				

From Table 5-13, total variances are divided into ten possible factors because of the use of principal component analysis. it retains 10 factors which account for 10.258%, 18.624%, 10.773%, 6.403%, 8.075%, 4.279%, 4.737%, 4.355%, 2.552% and 2.628%. In

total, 72.685 percent of variances is attributed to these ten factors. The summary of constructs study, including the total eigenvalue, variance explained, factor loading and communalities is illustrated in Table 5-14.

Table 5-14 Summary of variance explained, factor loading, and communalities of the constructs in this study

Constructs/ variables	Eigen value	Variance explained	Factor loading	Communalities
Construct1: Creation Creat.1 Creat.2 Creat.3 Creat.4 Creat.5	4.206	10.258	0.863 0.870 0.878 0.862 0.852	0.755 0.789 0.806 0.780 0.789
Construct2: Trust Trust1 Trust2 Trust3 Trust4	7.636	18.624	0.941 0.997 0.958 0.909	0.893 0.998 0.913 0.841
Construct3: Consumption Consump.1 Consump.2 Consump.3 Consump.4 Consump.5	4.417	10.773	0.688 0.864 0.901 0.836 0.791	0.552 0.769 0.784 0.720 0.718
Construct4: Social presence Soc.Pres1 Soc.Pres2 Soc.Pres3 Soc.Pres4 Soc.Pres5	2.625	6.403	0.985 0.735 0.941 0.724 0.588	0.916 0.606 0.877 0.583 0.444
Construct5: Reward Reward1 Reward2 Reward3 Reward4	3.311	8.075	0.852 0.889 0.941 0.929	0.751 0.797 0.902 0.854
Construct6: Social influence Soc.Inf1 Soc.Inf2 Soc.Inf3 Soc.Inf4 Soc.Inf5	1.755	4.279	0.756 0.760 0.738 0.860 0.747	0.643 0.578 0.642 0.725 0.589
Construct7: Cognitive Cog.1 Cog.2 Cog.3 Cog.4	1.942	4.737	0.721 0.898 0.798 0.679	0.543 0.784 0.672 0.513
Construct8: Affective Affect.2 Affect.4 Affect.5	1.786	4.355	0.975 0.851 0.676	0.906 0.739 0.541
Construct9: Contribution Contrib.1 Contrib.2 Contrib.3	1.046	2.552	0.870 0.826 0.910	0.834 0.758 0.875
Construct10: Conative Conat.3 Conat.4 Conat.5	1.078	2.628	0.666 0.758 0.682	0.508 0.574 0.541

5.4.4 Validity and reliability results of the proposed constructs

To confirm the validity and reliability of the constructs, all convergent validity, discriminant validity, face validity, reliability, and common method bias test will be analysed in section 5.4.1. to section 5.4.5

5.4.1 Convergent validity results

Accuracy based on the convergence parameters commonly used in sociology, psychology and other behavioural sciences means the level of degree to which two measures of constructs that should be theoretically relevant, are in fact relevant. The justification of convergent validity in this study is based on the loading factor of the proposed model. As illustrated in Table 5-12 that all 41 proposed variables have their loading factor ranges from the lowest at 0.588 for Soc.Press number 5 to the highest loading factor at 0.997 for Trust number 2. These all factor loading values are higher than a recommended threshold of factor loading value at 0.5. Therefore, it can confirm the convergent validity of this proposed constructs model.

5.4.2 Discriminant validity results

Discriminant validity is demonstrated by evidence that measures of constructs that theoretically should not be highly related to each other are, in fact, not found to be highly correlated to each other. To confirm the discriminant validity of this constructs model, the factor correlation matrix is proposed in Table 5-15.

Table 5-15 Factor correlation matrix

Factor	1	2	3	4	5	6	7	8	9	10
1	1.000	0.228	0.241	0.208	0.095	0.022	0.292	0.329	0.543	0.028
2	0.228	1.000	0.052	0.001	0.026	0.101	0.203	0.117	0.190	0.068
3	0.241	0.052	1.000	0.238	0.203	0.317	0.127	0.061	0.458	0.326
4	0.208	0.001	0.238	1.000	0.280	0.341	0.087	0.223	0.204	0.216
5	0.095	0.026	0.203	0.280	1.000	0.182	0.136	0.236	0.170	0.189
6	0.022	0.101	0.317	0.341	0.182	1.000	0.275	0.037	0.163	0.154
7	0.292	0.203	0.127	0.087	0.136	0.275	1.000	0.201	0.178	0.315
8	0.329	0.117	0.061	0.223	0.236	0.037	0.201	1.000	0.396	0.031
9	0.543	0.190	0.458	0.204	0.170	0.163	0.178	0.396	1.000	0.079
10	0.028	0.068	0.326	0.216	0.189	0.154	0.315	0.031	0.079	1.000

As highlighted earlier in section 4.6.3.6, the model will be proved to have a discriminant validity if their intercorrelation values amongst constructs are below 0.7. From Table 5-15, it shows that there are no correlation values in that matrix are exceeding the criterion. Therefore, the discriminant validity in this model is confirmed.

5.4.3 Face validity results

Face validity is the extent to which the test is seen as a perspective that covers the concepts to be used in measurements. It refers to the transparency or relevance of the test as it appears in the test participants. To consider a face validity in EFA, it is merely to look at the pattern matrix provided in table 5-12. All the variable that has a similar must be load onto the same factor. In this study Creat.1-5 are loading to construct1: Creation, Trust1-4 are loading to construct2: Trust, Consump. 1- 5 are loading to construct3: Consumption, Soc. Pres 1-5 are loading to construct4: Social presence, Reward 1-4 are loading to construct5: Reward, Soc.Inf1-5 are loading to Construct6: Social influence, Cog.1-4 are loading to construct7: Cognitive, Affect.2,4 and five are loading to construct8: Affective, Contrib.1-3 are loading to construct9: Contribution and Conat.3-5 are loading to construct10: Conative. To the light of these, all the variables in the same group are loading to single constructs in pattern matrix, which mean the face validity of this constructs model is confirmed.

5.4.4 Reliability results of construct model

Cronbach's alpha (α) is a measure of internal consistency, which is how close the relationship between items with the group is. It is considered as a measure of the reliability of scales. A generally accepted rule is that α of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or higher an excellent level. However, the cut-off value of this study is set at 0.7 to refer to (Gaskin, 2018). Results of α are demonstrated in 5-16

Table 5-16 Comparison of reliability of constructs of initial model and modified model based on Cronbach's Alpha

Initial model						Modified model		
Construct	N	items	Loading factors	Reliability	Modification	N	Loading factors	Reliability
Reward	5	Reward1	0.860	0.896	Remove Reward5	4	0.852	0.940
		Reward2	0.900				0.889	
		Reward3	0.953				0.941	
		Reward4	0.936				0.929	
		Reward5	0.339					
Trust	5	Trust1	0.932	0.862	Remove Trust 5	4	0.941	0.974
		Trust2	0.991				0.997	
		Trust3	0.961				0.958	
		Trust4	0.915				0.909	
		Trust5	0.353					
Social Influence	5	Soc.Inf1	0.756	0.878		5	0.756	0.878
		Soc.Inf2	0.766				0.760	
		Soc.Inf3	0.739				0.738	
		Soc.Inf4	0.864				0.860	
		Soc.Inf5	0.748				0.747	
Social presence	5	Soc.Pres1	0.982	0.895		5	0.985	0.895
		Soc.Pres2	0.737				0.735	
		Soc.Pres3	0.940				0.941	
		Soc.Pres4	0.712				0.724	
		Soc.Pres5	0.584				0.588	
Cognitive	5	Cog.1	0.669	0.805	Remove Cog.5	4	0.721	0.857
		Cog.2	0.941				0.898	
		Cog.3	0.792				0.798	
		Cog.4	0.677				0.679	
		Cog.5	0.328					
Affective	5	Affect.1	0.419	0.825	Remove affect 1,3	3		0.875
		Affect.2	0.938				0.975	
		Affect.3	0.421					
		Affect.4	0.895				0.851	
		Affect.5	0.726				0.676	
Conative	5	Conat.1	0.296	0.702	Remove Conat 1,2	3		0.773
		Conat.2	0.341					
		Conat.3	0.728				0.666	
		Conat.4	0.679				0.758	
		Conat.5	0.778				0.682	
Consumption	5	Consump.1	0.703	0.913		5	0.688	0.913
		Consump.2	0.879				0.864	
		Consump.3	0.916				0.901	
		Consump.4	0.869				0.836	
		Consump.5	0.811				0.791	
Contribution	5	Contrib.1	0.875	0.886	Remove Contrib.4,5	3	0.870	0.929
		Contrib.2	0.827				0.826	
		Contrib.3	0.953				0.910	
		Contrib.4	0.378					
		Contrib.5	0.531					
Creation	5	Creat.1	0.914	0.942		5	0.863	0.942
		Creat.2	0.949				0.870	
		Creat.3	0.897				0.878	
		Creat.4	0.829				0.862	
		Creat.5	0.810				0.852	

As seen in Table 5-16, after delete 9 items regarding to the convergent (Item in Yellow colour), discriminant, and face validity (item in Orange colour) problems of the initial model of 50 items (Delete Reward no. 5, Trust no. 5, Cog. no. 5, Affect. No1, Affect. No.3, Conat. No1, Conat. No. 2, Contribute. No. 4, Contribute No.5). The results of reliability of constructs of modified model based on 41 items in the modified model are as follows; 0.940, 0.974, 0.878, 0.895, 0.857, 0.875, 0.773, 0.913, 0.929, 0.942 for Rewards, Trust, Social influence, Social presence, Cognitive, Affective, Conative, Consumption, Contribution, and Creation respectively. This demonstrates that there is no single construct which has a value of Cronbach's alpha below the cut-off value.

From all the calibration measures of constructs model by EFA, 41 remaining items are confirmed to be further analysed for the measurement model using CFA in section 5.5

5.4.5 Results of common method bias test

The common method bias (CMB) occurs when the variability of the response is caused by the tool rather than the actual inclination of the respondents, which the instrument tries to reveal. This tool will suggest bias; therefore, the results will be contaminated with 'noise' caused by biased tools (Thoumrungroje, 2017). One of the common ways to test whether CMB is relevant to the studies is that to use of Harman single-factor score, which all items will be loaded as one common factor. If the total variance for a single factor is less than 50%, then CMB does not affect the data. Table 5-17 demonstrates the results of common method bias test using Harman single-factor score.

Table 5-17 Results of common method bias test using Harman single-factor score.

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.373	20.423	20.423	7.661	18.684	18.684
2	6.065	14.793	35.216			
3	3.360	8.196	43.412			
4	3.187	7.773	51.185			
5	2.811	6.856	58.041			
6	2.226	5.429	63.469			
7	2.004	4.888	68.358			
8	1.878	4.581	72.938			
9	1.443	3.519	76.457			
10	1.133	2.764	79.221			
11	0.715	1.744	80.964			
12	0.653	1.593	82.557			
13	0.576	1.405	83.962			
14	0.550	1.342	85.304			
15	0.496	1.209	86.514			
16	0.455	1.109	87.623			
17	0.434	1.057	88.681			
18	0.401	0.977	89.658			
19	0.389	0.948	90.606			
20	0.372	0.908	91.514			
21	0.345	0.841	92.355			
22	0.319	0.777	93.132			
23	0.285	0.694	93.826			
24	0.282	0.687	94.513			
25	0.242	0.591	95.104			
26	0.216	0.527	95.631			
27	0.209	0.509	96.140			
28	0.183	0.447	96.587			
29	0.181	0.442	97.029			
30	0.167	0.407	97.436			
31	0.158	0.386	97.822			
32	0.140	0.342	98.164			
33	0.131	0.321	98.485			
34	0.120	0.292	98.777			
35	0.115	0.279	99.056			
36	0.100	0.244	99.301			
37	0.074	0.179	99.480			
38	0.071	0.174	99.654			
39	0.064	0.155	99.810			
40	0.053	0.130	99.940			
41	0.025	0.060	100.000			

As seen in Table 5-17, the total variance for a single factor is accounted for 18.684%, hence, this is an evidence to show that the CMB does not affect the data in this study.

5.5 Results of measurement model assessment using Confirmatory factor analysis (CFA)

After confirming validity and reliability of constructs in measurement model using random 250 samples from the total valid samples in EFA, the rest of samples (458 samples) are used to continue in validating the measurement model using confirmatory factor analysis (CFA). In this step, the proposed model will be first examined the model fit index, which is to consider that how well our proposed model accounts for the correlations between variables in the dataset in section 5.5.1, then convergent validity and reliability is being examined in section through the measurement of Cronbach's alpha (CR), together with convergent validity and discriminant validity are also being examined in section 5.5.2

5.5.1 Result of model fit index

As decided in Chapter 4.7.2, this study will report p-value of Chi-square, RMSEA, CFI and TLI to confirm the model fit. Results of model fit are given in Table 5-18

Table 5-18 Results of model fit indices

Indices	Shorthand	Cut-off value	Model indices
Chi-square Ratio of Chi square to degree of freedom	χ^2 CMIN/df	p value <0.05 < 5	p value = 0.0 2.375
Comparative fit index	CFI	> 0.9	0.918
Root mean square error of approximation	RMSEA	< 0.8	0.055
Tucker-Lewis index	TLI	> 0.9	0.926

From Table 5-18, it can be seen those model indices in each group of model fit are more significant than a cut-off value, with the p-value =0 for Chi-square and CMIN/df at 2.375 for total model fit. This model has a CFI index at 0.918, RMSEA at 0.055, and TLI at 0.926. A measurement model is shown in Figure 5-7, and the continuing of the model investigation will be provided in Section 5.5.2

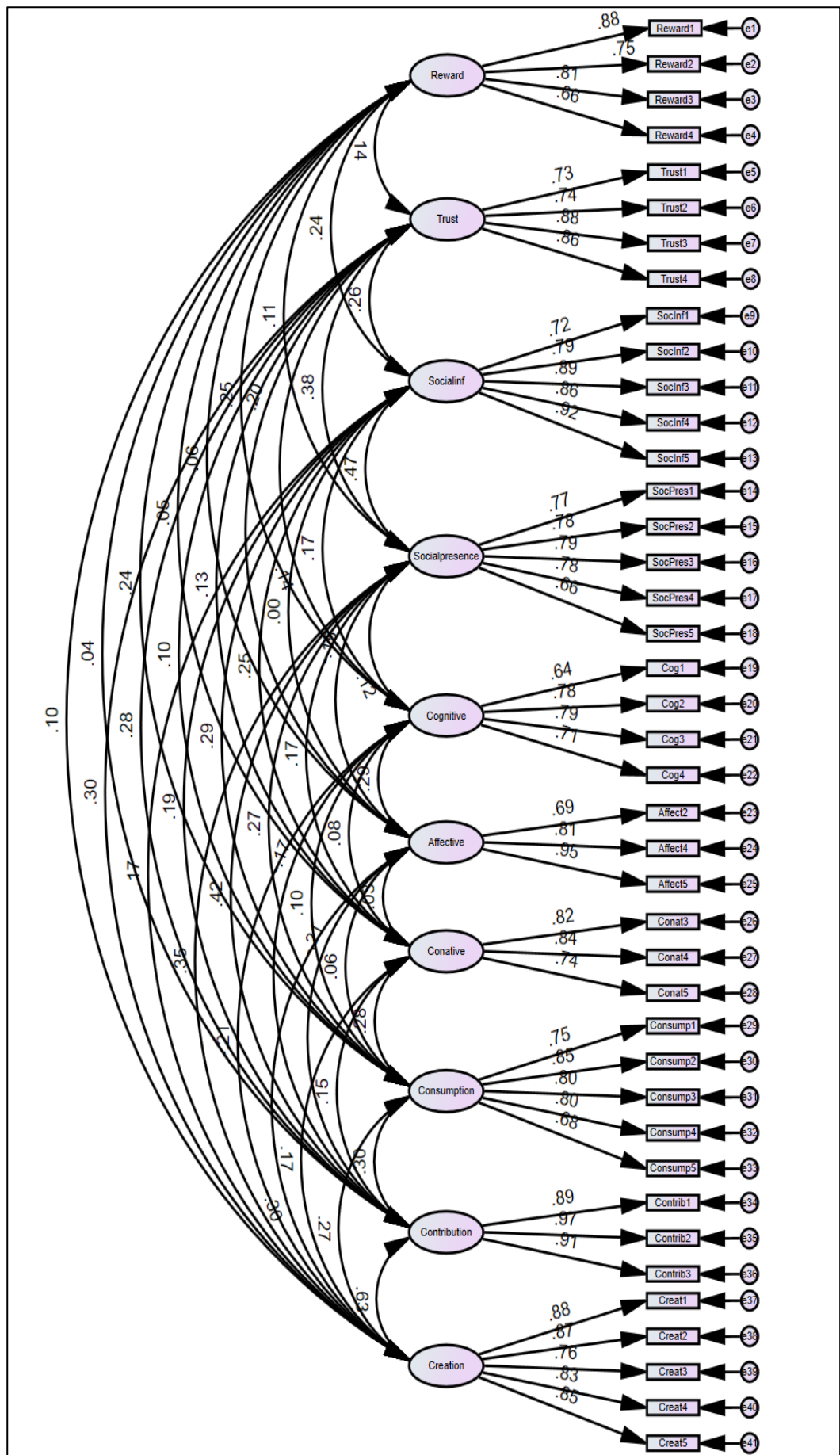


Figure 5-7 Measurement model

5.5.2 Results of reliability and validity of measurement model

5.5.2.1 Examined of reliability

Results of α of each construct can be calculated from the square of the sum of the loading factor in each construct divided by the sum of error of each factor in each construct. To be clearly understood, Cronbach's alpha regarding each construct will be summarised in Table 5-19

Table 5-19 Reliability of measurement model based on Composite reliability (CR)

Constructs	Indicators	Loading	Error	Sum loading square	CR
Reward	Reward1	0.88	0.222	9.604	0.859
	Reward2	0.75	0.445		
	Reward3	0.81	0.339		
	Reward4	0.66	0.566		
Trust	Trust1	0.73	0.470	10.227	0.878
	Trust2	0.74	0.457		
	Trust3	0.88	0.234		
	Trust4	0.86	0.264		
Social Influence	SocInf1	0.72	0.487	17.347	0.920
	SocInf2	0.79	0.382		
	SocInf3	0.89	0.213		
	SocInf4	0.86	0.264		
	SocInf5	0.92	0.157		
Social Presence	SocPres1	0.77	0.412	14.288	0.870
	SocPres2	0.78	0.392		
	SocPres3	0.79	0.376		
	SocPres4	0.78	0.388		
	SocPres5	0.66	0.563		
Cognitive	Cog1	0.64	0.587	8.602	0.824
	Cog2	0.78	0.387		
	Cog3	0.79	0.371		
	Cog4	0.71	0.490		
Affective	Affect2	0.69	0.518	6.052	0.864
	Affect4	0.81	0.339		
	Affect5	0.95	0.092		
Conative	Conat3	0.82	0.334	5.779	0.844
	Conat4	0.85	0.286		
	Conat5	0.74	0.448		
Consumption	Consump1	0.75	0.438	15.101	0.885
	Consump2	0.85	0.271		
	Consump3	0.8	0.362		
	Consump4	0.8	0.357		
	Consump5	0.68	0.536		
Contribution	Contrib1	0.89	0.206	7.678	0.946
	Contrib2	0.97	0.065		
	Contrib3	0.91	0.166		
Creation	Creat1	0.88	0.222	17.556	0.922
	Creat2	0.87	0.247		
	Creat3	0.76	0.425		
	Creat4	0.83	0.313		
	Creat5	0.85	0.272		

As seen in Table 5-19, values of composite reliability (CR) for the constructs in this study ranged from 0.824 for cognitive and 0.946 for contribution. This evidence can prove the reliability of this model.

5.5.2.2 Examined of convergent validity

The assessment can be verified through the average variance extracted (AVE). AVE is calculated by a sum of squares of standardized factor loadings divided by this value plus the total of error variances for indicators. AVE at 0.50 or higher, indicating that there is a sufficient convergence (Gaskin, 2018; Hair et al., 2014). Results of AVE in this study will be illustrated in Table 5-20

Table 5-20 Convergent validity of measurement model based on AVE

Constructs	Indicators	Loading	Error	Square loading	AVE
Reward	Reward1	0.88	0.222	0.778	0.607
	Reward2	0.75	0.445	0.555	
	Reward3	0.81	0.339	0.661	
	Reward4	0.66	0.566	0.434	
Trust	Trust1	0.73	0.470	0.530	0.644
	Trust2	0.74	0.457	0.543	
	Trust3	0.88	0.234	0.766	
	Trust4	0.86	0.264	0.736	
Social Influence	SocInf1	0.72	0.487	0.513	0.699
	SocInf2	0.79	0.382	0.618	
	SocInf3	0.89	0.213	0.787	
	SocInf4	0.86	0.264	0.736	
	SocInf5	0.92	0.157	0.843	
Social Presence	SocPres1	0.77	0.412	0.588	0.574
	SocPres2	0.78	0.392	0.608	
	SocPres3	0.79	0.376	0.624	
	SocPres4	0.78	0.388	0.612	
	SocPres5	0.66	0.563	0.437	
Cognitive	Cog1	0.64	0.587	0.413	0.541
	Cog2	0.78	0.387	0.613	
	Cog3	0.79	0.371	0.629	
	Cog4	0.71	0.490	0.510	
Affective	Affect2	0.69	0.518	0.482	0.684
	Affect4	0.81	0.339	0.661	
	Affect5	0.95	0.092	0.908	
Conative	Conat3	0.82	0.334	0.666	0.644
	Conat4	0.85	0.286	0.714	
	Conat5	0.74	0.448	0.552	
Consumption	Consump1	0.75	0.438	0.563	0.607
	Consump2	0.85	0.271	0.729	
	Consump3	0.8	0.362	0.638	
	Consump4	0.8	0.357	0.643	
	Consump5	0.68	0.536	0.464	
Contribution	Contrib1	0.89	0.206	0.794	0.854
	Contrib2	0.97	0.065	0.935	
	Contrib3	0.91	0.166	0.834	
Creation	Creat1	0.88	0.222	0.778	0.704
	Creat2	0.87	0.247	0.753	
	Creat3	0.76	0.425	0.575	
	Creat4	0.83	0.313	0.687	
	Creat5	0.85	0.272	0.728	

As demonstrated in Table 5-20, the average variance extracted for all constructs in this model is higher than the cut-off value at 0.5, with the ranges between 0.541 for cognitive construct and 0.854 for contribution construct. This evidence can be a proof for the convergent validity of the measurement model.

5.5.2.3 Examined of discriminant validity

Discriminant validity examines if two latent constructs are distinct (Hair et al., 2014). It can be assessed by comparing the maximum shared variance (MSV) with the AVE estimates. Discriminant validity for each construct is achieved if AVE for its construct is higher than MSV. This is evidence to prove that the construct is distinct. To calculate MSV, it requires to explore the correlation amongst constructs which is given in Table 5-21

Table 5-21 Standardized correlation

			Estimate				Estimate
Reward	<-- >	Trust	0.142	Socialinf	<-- >	Contribution	0.192
Reward	<-- >	Socialinf	0.24	Socialinf	<-- >	Creation	0.172
Reward	<-- >	Socialpresence	0.112	Socialpresence	<-- >	Cognitive	0.122
Reward	<-- >	Cognitive	0.245	Socialpresence	<-- >	Affective	0.149
Reward	<-- >	Affective	0.06	Socialpresence	<-- >	Conative	0.17
Reward	<-- >	Conative	0.053	Socialpresence	<-- >	Consumption	0.27
Reward	<-- >	Consumption	0.243	Socialpresence	<-- >	Contribution	0.425
Reward	<-- >	Contribution	0.041	Socialpresence	<-- >	Creation	0.351
Reward	<-- >	Creation	0.097	Cognitive	<-- >	Affective	0.285
Trust	<-- >	Socialinf	0.26	Cognitive	<-- >	Conative	0.083
Trust	<-- >	Socialpresence	0.382	Cognitive	<-- >	Consumption	0.095
Trust	<-- >	Cognitive	0.139	Cognitive	<-- >	Contribution	0.172
Trust	<-- >	Affective	0.202	Cognitive	<-- >	Creation	0.205
Trust	<-- >	Conative	0.128	Affective	<-- >	Conative	0.034
Trust	<-- >	Consumption	0.103	Affective	<-- >	Consumption	0.061
Trust	<-- >	Contribution	0.277	Affective	<-- >	Contribution	0.21
Trust	<-- >	Creation	0.3	Affective	<-- >	Creation	0.296
Socialinf	<-- >	Socialpresence	0.466	Conative	<-- >	Consumption	0.281
Socialinf	<-- >	Cognitive	0.169	Conative	<-- >	Contribution	0.152
Socialinf	<-- >	Affective	0.004	Conative	<-- >	Creation	0.174
Socialinf	<-- >	Conative	0.246	Consumption	<-- >	Contribution	0.299
Socialinf	<-- >	Consumption	0.291	Consumption	<-- >	Creation	0.267
				Contribution	<-- >	Creation	0.626

To calculate the MSV, firstly, it requires to explore the highest correlation of the interesting construct. For example, in Table 5-21, the highest correlation estimate of Reward is Cognitive, with the estimated value at 0.245. The MSV for Reward construct is the square value of the highest correlation estimate, which equal to the square of 0.245 = 0.06. Result of MSV, together with CR, and AVE will be summarised in Table 5-22

Table 5-22 Summarise of CR, AVE, and MSV of this study

	CR	AVE	MSV	Contribution	Reward	Trust	Social influence	Social presence	Cognitive	Affective	Conative	Consumption	Creation
Contribution	0.95	0.85	0.39	0.92									
Reward	0.86	0.61	0.06	0.04	0.78								
Trust	0.88	0.64	0.15	0.28	0.14	0.80							
Social influence	0.92	0.70	0.22	0.19	0.24	0.26	0.84						
Social presence	0.87	0.57	0.22	0.43	0.11	0.38	0.47	0.76					
Cognitive	0.82	0.54	0.08	0.17	0.25	0.14	0.17	0.12	0.74				
Affective	0.86	0.68	0.09	0.21	0.06	0.20	0.00	0.15	0.29	0.83			
Conative	0.84	0.64	0.08	0.15	0.05	0.13	0.25	0.17	0.08	0.03	0.80		
Consumption	0.88	0.61	0.09	0.30	0.24	0.10	0.29	0.27	0.10	0.06	0.28	0.78	
Creation	0.92	0.70	0.39	0.63	0.10	0.30	0.17	0.35	0.21	0.30	0.17	0.27	0.84

As shown in Table 5-22, MSV for all construct is lower than its AVE. This is evidence to prove the model has a discriminant validity and it can move on to the next analysis.

5.5.2.4 Results of invariance test

Measurement of invariance is to use a statistical property of measurements to indicate that the same structure is measured in certain groups. In this study, the invariance test is applied to study whether the specified measurements were interpreted in a similar way to conception by respondents representing different genders.

To test the invariances by the gender in this CFA model, data in CFA will be sorted into two groups, which are Male for group number1 and Female for group number 2, after running the analysis calculation, the results showing that the value of model fit of CFA after restricted to gender are as follows; CMIN/df = 1.842, p-value = 0.00, RMSEA = 0.043, CFI = 0.902, and PGFI = 0.638. All these values are above the cut-off value. Moreover, to indicate that there is a variance of the result based on gender or not, the comparison between the difference of χ^2 values and the degrees of freedom of unconstrained CFA model and the fully constraint CFA model is provided in Table 5-23. As a result, a p-value higher than 0.05 indicates that a restrictive model produces insignificant changes in the data model.

Table 5-23 result of invariance test based on gender

	<u>Chi-square</u>	<u>df</u>	<u>p-val</u>	<u>Invariant?</u>
<u>Overall Model</u>				
Unconstrained	2704	1468		
Fully constrained	2761.3	1513		
Number of groups		2		
Difference	57.3	45	0.103	YES

5.6 Structural model assessment

5.6.1 Assessment of structural model

After confirming the validity and reliability of the constructs and measurement, this section will provide a result of structural model assessment. The author employs Statistical programs of Analysis of Moment Structures (AMOS) version 26 to assess the model. As recommended by Sreejesh & Mohapatra (2013), three main issues need to be concerned when assessing the structural model, including, identify the direction of the relationship. This is to analyse that the results demonstrate the direction as it was in the proposed hypothesis or not. Secondly, to explore the strength or magnitude of the relationship between the constructs, whether it can provide such information to confirm the hypothesis or not. To do this, the absolute t values for the interested relationship should exceed 1.96 (for CI at 90%). Thirdly, to determine the effect power based on the number of variances in the endogenous variables (R^2). R^2 (also called the coefficient of determination), which is the proportion of variance (%) in the dependent variable that can be explained by the independent variable (Sreejesh & Mohapatra, 2013). Hence, as a rule of thumb for interpreting the strength of a relationship based on its R^2 and R^2 value ranges from 0 to 1, with 1 defining perfect predictive accuracy (Gaskin, 2018). Henseler et al. (2009) proposed a brief rule of thumb to consider the acceptable R^2 into three ranges which include with 0.75, 0.50, and 0.25 are described as substantial, moderate, and weak respectively. While, Cohen (1992) proposed that R^2 at .12 or below indicate low, between .13 to .25 values indicate medium, .26 or above and above values indicate high effect size. However, Sreejesh et al. (2014) mentioned that it is challenging to provide rules of thumb regarding what R square is appropriate as this varies from the

research area to research area. Besides, Peterson (2016) recommended that R-square higher than 0.60 is necessary for studies in the field 'Pure science' because the behaviour of molecules and or particles can be precisely predicted to a certain extent in scientific research, while the R-square higher minimum at 0.10 is generally accepted for studies in the arts, humanities and social sciences because human behaviour cannot be precisely predicted. This R square value is supported by Moksony (1990) who highlighted that for exploratory research, using cross-sectional data, values of R square at 0.10 are typical. Hence, as a nature of this research is considered to be an exploratory in social science, the minimum R square value to be accepted in this study will be set at 0.10. The result of the structural model assessment of this study from AMOS is illustrated in Figure 5-8

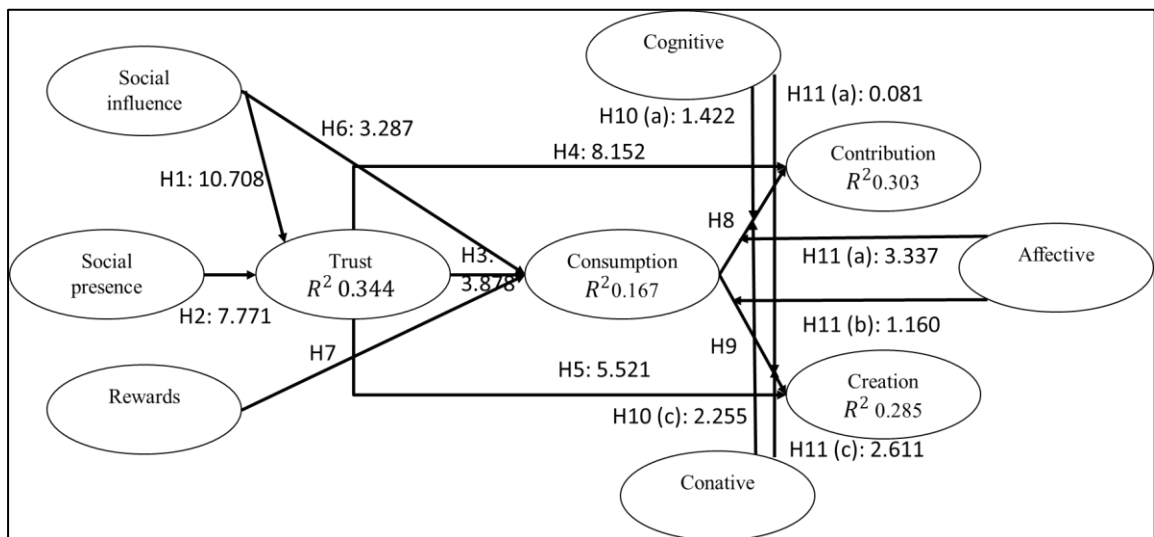


Figure 5-8 Results of structural assessment model from AMOS

To better understand the result of the structural measurement model, data will be transformed into Table 5-24 in order to assess the structural model, particularly to explore the strength or magnitude of the relationship between the constructs, whether it can provide such information to confirm the hypothesis or not.

Table 5-24 Results of a structural model assessment based on validation samples (N=458)

Parameter	Estimate	Std.error	t-value		Hyp.	Result
Socialinf => Trust	0.536	0.050	10.708	0.344	H1	Sig. ***
Socialpresence => Trust	0.353	0.045	7.771		H2	Sig. ***
Trust => Consumption	0.146	0.038	3.878	0.167	H3	Sig. ***
Socialinf => Consumption	0.162	0.049	3.287		H6	Sig. ***
Reward => Consumption	0.143	0.031	4.565		H7	Sig. ***
Trust => Contribution	0.407	0.050	8.152	0.303	H4	Sig. ***
Consumption => Contribution	0.355	0.065	5.510		H8	Sig. ***
Trust => Creation	0.264	0.048	5.521	0.285	H5	Sig. ***
Consumption => Creation	0.339	0.062	5.484		H9	Sig. ***
Cog_x_Consumption => Contribution	0.069	0.049	1.422	0.303	H10a	NS (0.155)
Affect_x_Consumption => Contribution	0.157	0.047	3.337		H10b	Sig. ***
Conat_x_Consumption => Contribution	0.116	0.052	2.255		H10c	Sig **
Cog_x_Consumption => Creation	0.004	0.047	0.081	0.285	H11a	NS (0.935)
Affect_x_Consumption => Creation	0.052	0.045	1.16		H11b	NS (0.246)
Conat_x_Consumption => Creation	0.129	0.049	2.611		H11c	Sig. ***
<i>Note: 1. t-values in parentheses. *p<0.10, **p<0.05, ***p<0.01</i>						
<i>2. Bold figures represent the hypothesis that is supported by the survey data.</i>						
<i>3. Red figures represent the hypothesis that is unsupported and rejected by the survey data.</i>						
<i>CFI =0.971, RMSEA = 0.078, TLI =0.924, CMIN 90.643, DF20, CMIN/DF = 4.532 at p-value = 0.000</i>						

As shown in Table 5-24, the result of the test of SEM and the signs of the coefficients representing the hypotheses incorporated in the model are as expected. This means that the relationship in the model under the analysis is in accordance with the relationship in literature findings. The most significant role of SEM is to examine the significance test of hypotheses in order to accept or reject the proposed hypotheses that the author have already defined in Chapter3. In Table 5-24, all the direct effect (H1 to H9) showing that it is a statistically significant level at $p < 0.01$. Therefore, these following hypotheses were supported by empirical data; (1) Social influence has a positive and significant effect on customer-brand trust in SM (H1 could not be rejected at t value 10.708 and p-value < 0.01). (2) Social presence has a positive and significant effect on customer-brand trust in

SM (H2 could not be rejected at t value 7.771 and p-value < 0.01). (3) Customer-brand trust in SM has a positive and significant effect on the SM consumption (H3 could not be rejected at t value 3.378 and p-value < 0.01). (4) Customer-brand trust in SM has a positive and significant effect on the value contribution to the company (H4 could not be rejected at t value 8.152 and p-value < 0.01). (5) Customer-brand trust in SM has a positive and significant effect on the value creation of the company (H5 could not be rejected at t value 5.521 and p-value < 0.01). (6) Social influence has a positive and significant effect on the consumption in SM (H6 could not be rejected at t value 3.287 and p-value < 0.01). (7) The reward has a positive and significant effect on the consumption in SM (H7 could not be rejected at t value 4.565 and p-value < 0.01). (8) SM consumption has a positive and significant effect on the value contribution to the company (H8 could not be rejected at t value 5.510 and p-value < 0.01). Moreover, (9) SM consumption has a positive and significant effect on the value creation of the company (H9 could not be rejected at t value 5.484 and p-value < 0.01).

In addition to the direction and magnitude of the relationship between the constructs, the results also support that all the R^2 value for the endogenous variables in the model is in an acceptable range; R^2 for Customer-brand trust is 0.344, R^2 for SM consumption is 0.167, R^2 for SM contribution is 0.303, and R^2 for SM creation is 0.285.

Apart from the direction, magnitude, and the determination of the effect power based on the number of variances in the endogenous variables, the study assessed the model fit. The results revealed that all the fit indices are over the cut-off values, including CFI 0.971, RMSEA 0.078, TLI 0.924, CMIN/DF 4.532 at p-value 0.000. Therefore, the results presented substantive evidence that the data support the proposed conceptual framework according to these model fit indices.

Besides, this model is also assessing the interaction effect between the moderation construct onto the relationship in the direct effect. Results presented in Table 5-24, there are six interaction of these relationships to be assessed. In total, three moderation effect is confirmed to be statistically significant, while the other three are rejected. To be explained; (10) The collected data does not support that cognitive environmental moderate the relationship between customer's SM consumption and valuable contribution to the company (H 10 (a) is rejected at t value 1.422 and p-value at 0.155). (11) The collected data does not support that cognitive, environmental awareness

moderates the relationship between customer's SM consumption and value creation to the company (H 11 (a) is rejected at t value 0.081 and p-value at 0.935), and (12) The collected data does not support that affective environmental awareness moderates the relationship between customer's SM consumption and value creation to the company (H 11 (b) is rejected at t value 1.16 and p-value at 0.246). While the other three hypotheses were supported. (13) Affective environmental awareness moderates the relationship between customer's SM consumption and valuable contribution to the company (H 10 (b) is supported at t value 3.337 and p-value < 0.01). (14) Conative environmental awareness moderates the relationship between customer's SM consumption and valuable contribution to the company (H 10 (c) is supported at t value 2.255 and p-value < 0.05). Moreover, (15), Conative environmental awareness moderates the relationship between customer's SM consumption and value creation to the company (H 11 (c) is supported at t value 2.611 and p-value < 0.01).

The moderation effect between affective environmental awareness on the relationship between SM consumption and SM contribution is illustrated in Figure 5-9

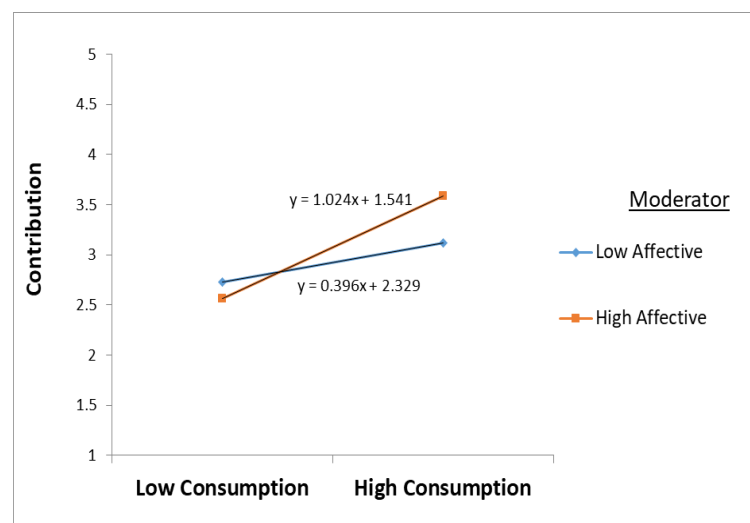


Figure 5-9 The moderation effect between affective environmental awareness on the relationship between SM consumption and SM contribution

As illustrated in Figure 5-9, affective environmental awareness strengthens the positive relationship between SM consumption and SM contribution, the more level of affective, the higher level of contribution to SM will be made. In addition, the moderation effect between conative environmental awareness on the relationship between SM consumption and SM contribution is illustrated in Figure 5-10

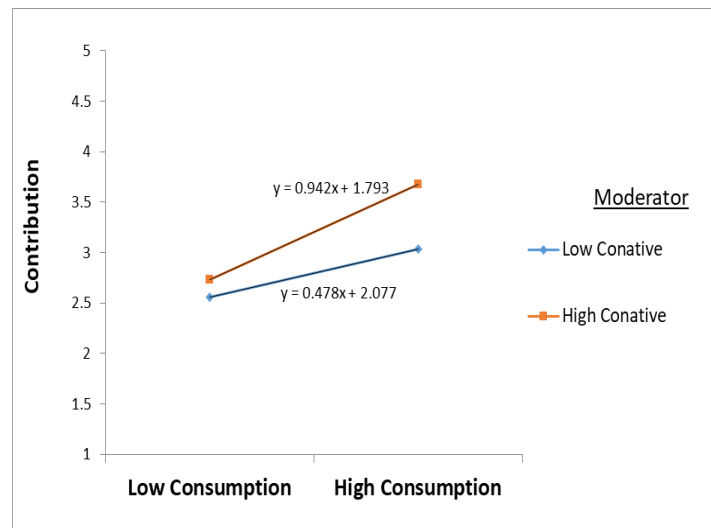


Figure 5-10 The moderation effect between conative environmental awareness on the relationship between SM consumption and SM contribution

As shown in Figure 5-10, conative environmental awareness strengthens the positive relationship between SM consumption and SM contribution, the more level of conative, the higher level of contribution to SM will be made. In addition, the moderation effect between conative environmental awareness on the relationship between SM consumption and SM creation is illustrated in Figure 5-11

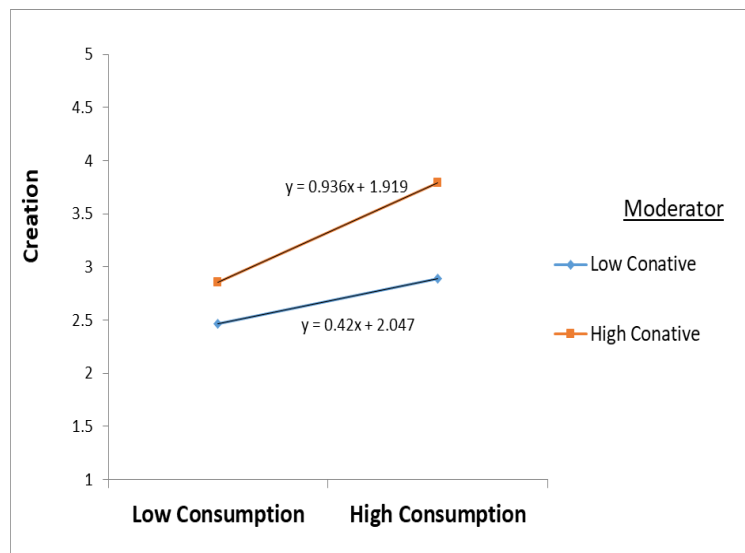


Figure 5-11 The moderation effect between conative environmental awareness on the relationship between SM consumption and SM creation

As shown in Figure 5-11, conative environmental awareness strengthens the positive relationship between SM consumption and SM creation, the more level of conative, the higher level of contribution to SM will be made.

5.6.2 Cross validation

In the cross-validation section, the purpose is to assess that the proposed model fits with samples other than the one that is developed or not. To do this, the 250 response which has been used in constructs calibration (EFA) will be further used to test the model. Results of model estimation are provided in Table 5-25

Table 5-25 Results of a structural model assessment to assess the cross validation based on calibration samples (N=250)

Parameter	Estimate	Std.error	t-value		Hyp.	Result
Socialinf => Trust	0.454	0.058	7.771	0.336	H1	Sig. ***
Socialpresence => Trust	0.318	0.055	5.839		H2	Sig. ***
Trust => Consumption	0.159	0.054	2.929	0.180	H3	Sig. ***
Socialinf => Consumption	0.170	0.061	2.778		H6	Sig. ***
Reward => Consumption	0.123	0.039	3.167		H7	Sig. ***
Trust => Contribution	0.388	0.078	4.958	0.322	H4	Sig. ***
Consumption => Contribution	0.499	0.103	4.824		H8	Sig. ***
Trust => Creation	0.386	0.141	2.740	0.268	H5	Sig. ***
Consumption => Creation	0.381	0.094	4.049		H9	Sig. ***
Cog_x_Consumption => Contribution	0.042	0.103	0.408	0.322	H10a	NS (0.683)
Affect_x_Consumption => Contribution	0.164	0.077	2.132		H10b	Sig. **
Conat_x_Consumption => Contribution	0.14	0.081	1.735		H10c	Sig *
Cog_x_Consumption => Creation	0.085	0.094	0.909	0.268	H11a	NS (0.363)
Affect_x_Consumption => Creation	0.079	0.074	1.076		H11b	NS (0.282)
Conat_x_Consumption => Creation	0.267	0.071	3.755		H11c	Sig. ***
<i>Note: 1. t-values in parentheses. *p<0.10, **p<0.05, ***p<0.01</i>						
<i>2. Bold figures represent the hypothesis that is supported by the survey data.</i>						
<i>3. Red figures represent the hypothesis that is unsupported and rejected by the survey data.</i>						
<i>CFI =0.962, RMSEA = 0.071, TLI =0.937, CMIN 45.107, DF 20, CMIN/DF = 2.255 at p-value = 0.001</i>						

From Table 5-25, it is shown that the results of a structural model assessment using the calibration samples (N=250) are in agreement to the results in validation samples model (Table 5-24) in terms of the sign of a relationship, and the acceptance and rejection of hypotheses. Also, R^2 value and model fit indices are above the cut-off value. Hence, this can confirm that the model fit with data to a different sample.

5.7 Chapter summary

The key findings of this chapter are summarised in Table 5-26

Table 5-26 Summary of key findings in analysis and results chapter

<p style="text-align: center;">Results from Pilot study</p> <p>43 Thai university students in an international course in Thailand accepted to be respondents in the Pilot study test. Two sets (English language) and (Thai language) of the questionnaire were delivered to participants by e-mail through an online web-based survey, namely Qualtrics. A paired t-test was employed in this study to determine if the average difference between the two sets of observations is zero. Results revealed that there is no difference to be founded. This ensured the validity in the translation of the questionnaire.</p>
<p style="text-align: center;">Results from data screening process</p> <p>The total complete data in this study are 708 cases out of 746 returned responses in the final survey. Hence, listwise data deletion was employed to reduce bias in missing data imputation process. 708 data showed that there are no significant issues in multivariate outlier, normality, linearity, and multicollinearity normality. Therefore, 708 completed data will be further analysed in this survey.</p>
<p style="text-align: center;">Results from constructs calibration using EFA</p> <p>A total sample was split into two groups (250samples and 458 samples). One group contains 250 samples were used to test the validity of variables and constructs in this survey. Results showed that nine from 50 items were removed to ensure the validity and reliability of constructs. Therefore, 41 items were remained to be further study.</p>
<p style="text-align: center;">Results from measurement model validation using CFA</p> <p>458 Samples were used in the model validation process. Results confirmed reliability, convergent validity, and discriminant validity of measurement model.</p>
<p style="text-align: center;">Results from model assessment</p> <p>From 15 hypotheses developed in this survey, 12 hypotheses were proved to be accepted from the data.</p> <p>(H1) Social influence has a positive and significant effect on customer-brand trust in SM</p> <p>(H2) Social presence has a positive and significant effect on customer-brand trust in SM.</p> <p>(H3) customer-brand trust in SM has a positive and significant effect on the SM consumption</p> <p>(H4) customer-brand trust in SM has a positive and significant effect on the value contribution to the company</p> <p>(H5) customer-brand trust in SM will have a positive and significant effect on the value creation</p> <p>(H6) Social influence has a positive and significant effect on the consumption in SM</p> <p>(H7) A reward has a positive and significant effect on the consumption in SM</p> <p>(H8) SM consumption has a positive and significant effect on the value contribution to the company</p> <p>(H9) SM consumption has a positive and significant effect on the value creation of the company</p> <p>(H10(b)) Affective environmental awareness moderates the relationship between customer's SM consumption and valuable contribution to the company (H10(c)) Conative environmental awareness moderates the relationship between customer's SM consumption and valuable contribution to the company (H11(c)) Conative environmental awareness moderates the relationship between customer's SM consumption and value creation to the company</p>

6 Discussion, implication, and conclusions

6.1 Chapter overview

This chapter synthesises the findings with reference to the current literature and discusses them regarding to the two research questions in section 6.2. Following this, the theoretical contributions are highlighted in section 6.3, which leads to the discussion of managerial implications in section 6.4. Moreover, research limitations are provided in section 6.5, a few suggestions for future research are discussed in section 6.6, and a summarise of this chapter will be concluded in section 6.7 A structure of this chapter is illustrated in figure 6-1

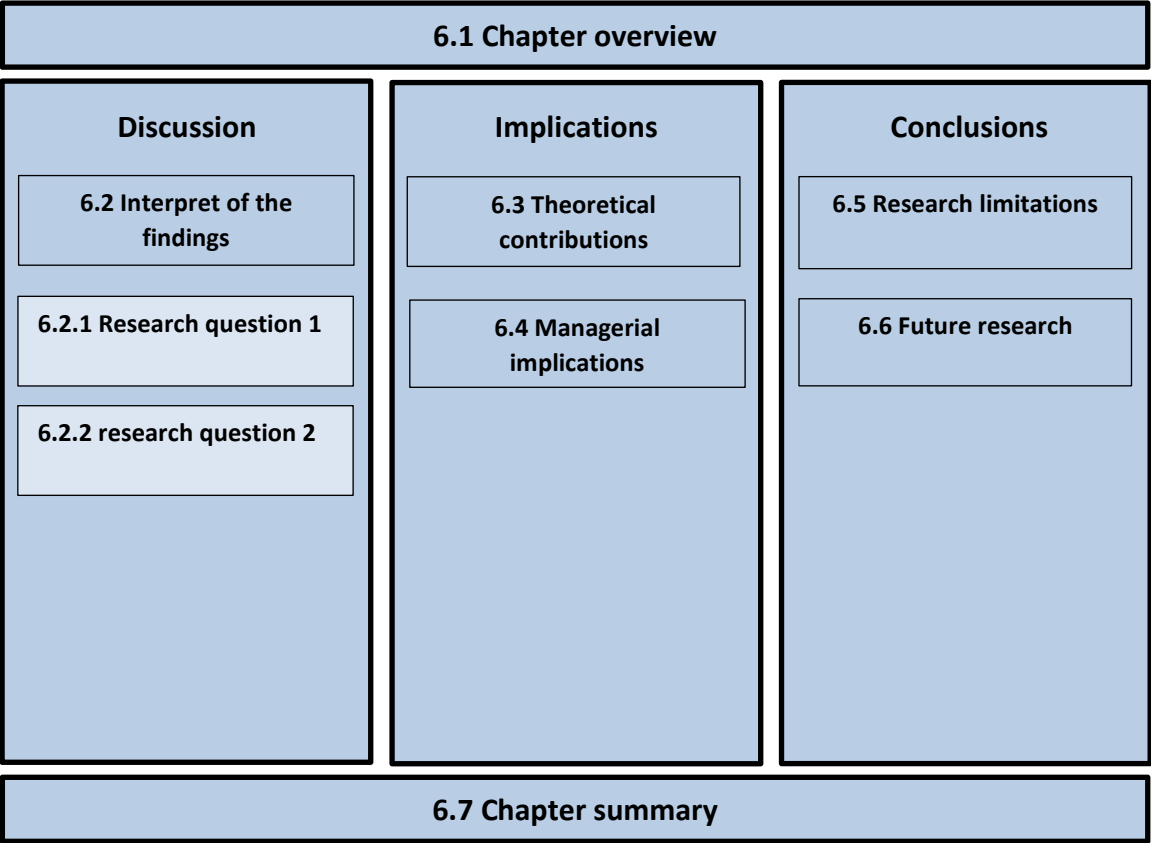


Figure 6-1 A structure of discussion, implication, and conclusions chapter

6.2 Interpret of the findings

Role of consumers in the value creation has been changed from being isolated to be connected to the industrial system in many ways such as information access, networking, experimentation (Prahalad, Coimbatore K., 2004). One of the changing aspects is that customer can now access to the information and activities of the firm clearer by visiting the firm's Facebook page. On the other hands, a firm can get to the information provided by the consumer as they can share, communicate of their experiences and knowledge through the online community (Piller et al., 2012). Even though social media usage is widespread, yet previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape (Baumöl et al., 2016; Fletcher et al., 2016; Garrido-Moreno et al., 2020; Rodriguez et al., 2015). This is because, research on mechanisms that control these specific customer engagement behaviours on social media brand platforms is limited (Jayasuriya & Azam, 2017; Suseno et al., 2018). Numerous studies have examined various factors affecting the use of online social networking sites. However, investigations of these factors are still under development, especially in the context of Thailand. Most of the SM study in Thailand has a limit to the use of SM on purchase intention or tourism perspective. There is a lacks study in the behavioural of SM user in Thailand perspective. In this study, we aim to participate in literature by expanding and testing existing conceptual concepts in these contexts, especially to examine how is the antecedence of customer's engagement in social media impact to the Thai customer's value creation to SM.

In addition to the relationship between customer engagement and value creation to the company on SM, the social media has known as a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness, but none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company. Therefore, this study will also focus on how the attitude about

environmental awareness contributes to the engagement in social media, especially to co-generation value to the company.

The author specified and interlinked these interrelationships between antecedence of customer's engagement in social media based on the theory of planned behaviour (TPB) and We-intention framework, with the knowledge of value co-generation in SM by the use of consumer's online brand-related activities (COBRA) model, with the assessment of customer's attitudinal on environmental awareness towards these relationships. The authors then proposed a conceptual framework with 15 hypotheses to be tested. Therefore, the proposed study using a quantitative method is carried out through a survey in order to test the hypotheses. To do this, there are four main steps, including (1) the pilot study, which is employed to ensure the accuracy of a translation in research questions. Because the construct and questionnaires items were developed from literature in English, while, the questionnaire in the final survey will be carried out in the Thai language as a target respondent are Thai. (2) Constructs calibration using EFA, as the research is being done in the context of Thailand, while the constructs were developed based on others context of the study, therefore, this step is to ensure the propriety and explore the underlying issues of the constructs. (3) Measurement model validation, this is to assure the validity and reliability of the model—finally, (4) Structural model assessment in order to test the provided hypotheses from existing literature.

Even though, this study focus on the effect of customer's environmental awareness on the relationship between customer's engagement and value creation to the company in SM, there are others possible moderation factors which are not focus in the scope of this study. For example, types of SM platform, in which different types of SM can be used in different purpose for the customer and hence can create different level of engagement and value to be co-created with the company. Also, types of company as they are product, service, or product and service provider. This is because customer are expected to be involved in service dominant company rather than those who are dealing with the product dominant company.

These example of possible moderation effect on the relationship between customer's engagement and value creation to the company can be further study in the future work.

From the findings of the results in Chapter5, these current findings from empirical data will be discussed together with the previous literature regarding the research question 1 in section 6.2.1 and research question 2 in section 6.2.2.

6.2.1 Research question 1

6.2.1.1 Roles of social influence, social presence on customer-brand trust in SM

Previous studies have identified that social influences and social presence as two essential mechanisms to understand customers-brand trust in social media (Calefato et al., 2015; Gefen & Straub, 2004; Shin, 2010; Saeri et al. 2015). It is found that social influence factors play a more critical role in high-sociability media users (N. Wang & Sun, 2016). While the importance of social presence on trust is getting higher when the rules and customs are not sufficient, people rely on trust and familiarity as primary mechanisms to reduce social uncertainty (Gefen & Straub, 2004). Hence, two hypotheses were carried out in order to prove whether the social influence and social presence impact on customers brand to trust for the Thai adolescent customer or not. Therefore, hypotheses were proposed as H1: Social influence will have a positive and significant effect on customer-brand trust in SM and H2 Social presence will have a positive and significant effect on customer-brand trust in SM.

Results from empirical study confirmed the significant relationship between social influence on customer-brand trust and social presence on customer-brand trust. These results also in accordance with the study of Hamilton & White (2012) that the role of social influence on trust to the young people is high as shown in the result finding that the t-value of social influence on brand trust is 10.707, while the impact of social presence on trust is a little bit lower as t-value at 7.771. Also, in case of Thailand, teenagers were founded to be the top 2 in SM accession and usage (Lee-sanguansuk, 2019; Norcross, 2019). Hence, this is also supported the work of N. Wang & Sun (2016) that social influence factors play a more critical role in high-sociability media users.

To conclude, the impact of social influence and social presence on consumer's-brand trust for the Thai adolescent customer was founded to be significant based on the empirical data, with a higher significant of social influence on customer's-brand trust compared to the impacts of social presence on customer's-brand trust. This is because

young people are likely to be under-peers pressured from their friends and family (Pelling, E. L., & White, 2009).

6.2.1.2 Roles of customer's-brand trust on engagement and value creation in SM

McLaughlin & Stephens (2019) investigated the social media adoption intentions of SME owner; they found that the driver of the trust does not have a significant relationship to social media adoption intention for SME owners. These findings do not support previous research (Gefen et al., 2005; Lowry et al., 2010; Shin, 2010; T. Zhou, 2011) which shows the critical roles these players have. Therefore, the differences in previous studies in a role of trust on SM, especially in the context of Thailand need to be explored. As the results of empirical data from Thai university student demonstrates that customers-brand trust not only play an important role in encouraging the level of engagement in SM, it is also impact to the value generation to the company. As the empirical testing and validation of the model confirms the significance of these three hypotheses; H3: Customer-brand trust in SM has a positive and significant effect on the SM consumption. H4: Customer-brand trust in SM will has a positive and significant effect on the value contribution to the company. And H5: Customer-brand trust in SM has a positive and significant effect on the value creation to the company. This is not only to support the work of Gefen et al. (2005); Lowry et al. (2010); Shin (2010) and T. Zhou (2011), but it is also extend the existing knowledge of trust and social media as it can further accounted for a key factor of value generation on SM. This outcome can be a starting point on the study in another context of study (e.g. in the different culture, or country, or ages)

6.2.1.3 Roles of rewards and social influence on engagement in SM

Higher rewards reflect higher satisfaction, increase excessive consumer awareness, and the attractiveness of brand relationships, thereby increasing the customer's willingness to continue to contact the brand (Hamilton et al., 2016). Many researchers confirmed that rewards would promote customer engagement in online brand communities (Jang et al., 2008; Kim et al., 2008). And it can classify the type of rewards into financial (monetary and nonmonetary rewards), functional, social, and psychological rewards (Garrido-Moreno et al., 2020; Hamilton et al., 2016; Song & Yoo, 2016; Sreejesh et al., 2014). However, it is highlighted that not every item has a similar importance to the engagement in social media (Song & Yoo, 2016). The data from empirical results support that financial, psychological, and functional rewards are important to engage in social

media for Thai adolescent customers. This can be shown in the hypotheses testing that: The reward has a positive and significant effect on the consumption in SM at t value 4.565.

Social influence is found to alter customer behaviours toward engagement in SM. This is because, in the present study, engagement in social media is thought to be a social action using reference groups, and most of the researcher found that customers reflect the perceptions of groups as their perceived intention (N. Wang & Sun, 2016; Cheung et al., 2011; De Oliveira & Huertas, 2015; A. X. Shen et al., 2010; K. Wang et al., 2018). The data from empirical results support that social influence rewards are significant to the engagement in social media for Thai teenagers' customers. This is evidenced by hypotheses number 6 that social influence has a positive and significant effect on the consumption in SM at t value 3.287

In conclusion, the impact of social influence and rewards on SM engagement for the Thai adolescent customer was founded to be significant based on the empirical data.

6.2.2 Research question 2

6.2.2.1 Roles of customer's environmental awareness on the relationship between engagement and value generation to company in SM

Regarding to the study of Shao (2009), levels and types of consumer's engagement with brands on social media based on COBRA framework is classified from low level of engagement to high level of engagement into consumption, contribution, and creation, respectively. Building on the work of Shao, many authors, however, revealed that consumption is a basis of engagement in social media, and it can leads to contribution and creation of value to the company later on (Baumöl et al., 2016; Muntinga et al., 2011; B Schivinski et al., 2016). The data from empirical results support the work of Baumöl, Muntinga, and B Schivinski that consumption in SM leads to the value's contribution and value creation in SM for the case of Thai teen customers. This is evidenced by two hypotheses: H8 SM consumption has a positive and significant effect on the value contribution to the company at t value 5.510, and H9 SM consumption has a positive and significant effect on the value creation of the company at t value 5.484.

In terms of the assessment of the customer's environmental awareness on the relationship between engagement and value generation to the company in SM, It needs

to draw attention from the existing study that the social media has become a tool to help customers voluntarily participate in providing suggestions/ideas for improvement and working with others, especially in terms of environmental awareness (Carlson et al., 2018). Most of the studies (Amir Rahim et al., 2019; Rahim & Jalal adeen, 2016; Yildiz & Budur, 2019) revealed the effect of social media into environmental awareness, but none of them focuses on the opposite side which is how environmental attitudes of the customer can create the different level of engagement in SM, especially in terms of different value creation level to the company. Therefore, it is necessary here to ensure that the attitude about environmental awareness contributes to the engagement in social media, especially to value generation to the company. Since there have yet to be any literature studies regarding this topic, this study needs to be done to explore the role of customer's environmental awareness to the value generation in SM. This research explores how the customer's environmental attitude is related to the engagement and creation of value to the company. Based on the existing knowledge of Gruss et al. (2020), Bruno Schivinski (2019), Vale & Fernandes (2018), value creation in SM in this research can be classified into low, medium, and high regarding consumption, contribution, and creation behaviour. While, environmental awareness is interpreted as a form of attitude to the environment (Ferguson et al., 1974; Ojiaku et al., 2018; Zubair & Chotib, 2020). It comprised of three main dimensions from low to high as: cognitive, affective, and conative.

The empirical results reveal that it does not impact the relationship between environmental attitude and the value generation to the company at the cognitive dimension of environmental awareness. This evidence by two hypotheses are rejected in the structural model assessment: H10 (a) The collected data does not support that cognitive environmental moderate the relationship between customer's SM consumption and valuable contribution to the company. Hence H10 (a) is rejected at t value 1.422 and p-value at 0.155. Moreover, results from the empirical data do not support H11 (a) that cognitive, environmental awareness moderates the relationship between customer's SM consumption and value creation to the company, therefore H 11 (a) is rejected at t value 0.081 and p-value at 0.935).

For the affective environmental awareness attitude, the result from empirical data illustrate that it only impacts to the contribution value to the company as demonstrated

in section 5.5.2 that, while it does not strengthen the positive relationship between SM consumption and SM creation as the collected data does not support that affective environmental awareness moderates the relationship between customer's SM consumption and value creation to the company (H 11 (b) is rejected at t value 1.16 and p-value at 0.246). This is to conclude that the more level of affective, the higher level of contribution to SM will be made.

While at the conative level of environmental awareness attitude, empirical data shows that conative environmental awareness strengthens the positive relationship between SM consumption and SM contribution, and between SM consumption and SM creation. Therefore, the more level of conative, the higher level of contribution, and creation to SM will be made. These illustrates in two hypotheses: H 10 (c) for the contribution is supported at t value 2.255 and (H 11 (c) for creation is supported at t value 2.611

The rejection of these hypotheses (H10a, H11a, and H11c) are showing that the higher level of customer's environmental awareness relate to the level of engagement and value creation the company in SM. This results are similar to the existing studies, regarding to the age of participant by the study of Severo et al. (2019) who compared the influence of social networks on environmental awareness and the social responsibility by *generations of participants* (baby-boomer, X, Y), or *cross-national comparison* by Mayerl & Best (2019) who observed attitudes and behavioural intentions to protect the environment in a different nation, or cost and living place (city or rural) from (Byrka et al., 2017), and towards the *niche market* such as the environmental awareness on organic food purchase (Kusumaningsih et al., 2019). All of these studies confirmed that there is a correlation between level of environmental awareness and engagement in SM, however, none of these fail to clarify these different customer's environmental awareness into groups. While, these rejection of hypotheses can be applied in segmenting customer's environmental awareness into three different group as high, moderate, and low.

To be easier to apply the discovered knowledge in practice, the author proposes a framework of the relationship between different environmental awareness of customers and level of value generation to the company in social media in Figure 6-2

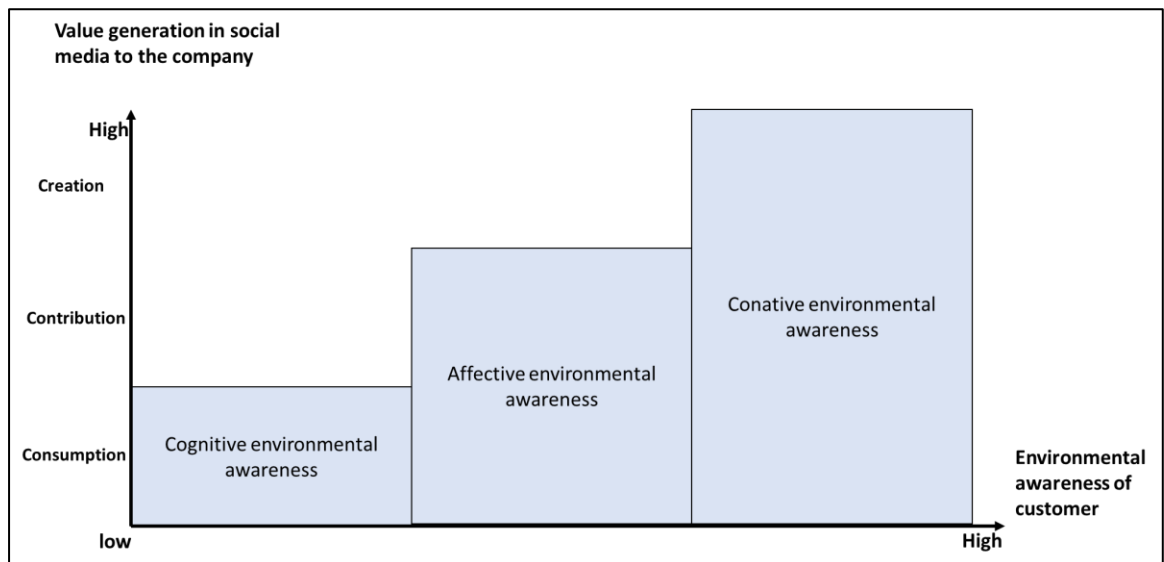


Figure 6-2 A framework of relationship between environmental awareness and value creation in SM

Overall, the results from empirical data can be used to generate a framework of the relationship between environmental awareness and value creation in SM, as shown in Figure 6-2. As seen in the above figure, the level of environmental awareness of customer relates to the willingness of different value to be given to the company. At the cognitive level, customers who have the knowledge or thinking about environmental issues are revealed to consume the value proposed by the company. While, in the higher level at affective environmental awareness, customers are willing not only to consume the value, but they are pleased to contribute values back to the company by activities such as giving a rating of products, engage in brand conversation, joining brand profile, and commenting on brand-related posts in SM. Besides, in the conative environmental awareness level, customers are not only consumed, contribute, but they are willing to co-create values back to the company by activities such as publishing the brand-related post, writing an article regarding the brand, uploading brand media such as pictures, videos, and writing a review of the product in SM.

This refined framework from the empirical data can be useful in both theoretical contributions, which can be further explained in section 6.3, and also to the managerial implication as they can use it in how to strategically manage customer relationship on social media to gain the higher benefits to a company which is illustrated in section 6.4.

6.3 Theoretical contributions

The empirical validation of the theoretical model would add value over the existing literature of customer-brand relationship management in many ways. First of all, it provides a comprehensive, detailed, and integrated understanding of how customer engagement can generate value to the company in social media. This response to the assumption of Baumöl et al. (2016), Fletcher et al. (2016), Garrido-Moreno et al. (2020) and Rodriguez et al. (2015) who suggested that even though social media usage is widespread, yet previous research failed to explain how to use social media tools strategically to create business value in the growing digital landscape, in which the author has linked the usage of social media to the value creation to the company in this study and confirm the role of customers-brand trust, social influence, social presence, and rewards on the engagement in social media through a result from empirical data.

Secondly, the author extended the knowledge from the exiting model (TPB, We-intention, COBRA framework) to verifying this knowledge in the context of Thailand, in which, there is a lacks study in the behavioral of SM user in Thailand perspective (Lee-sanguansuk, 2019; Norcross, 2019). In this study, the author expands, and testing existing conceptual concepts in this context by examining how is the antecedence of customer's engagement in social media impact to the Thai customer's value creation to SM. And the results can contribute to the extension of CRM in the developing country.

Thirdly, the study generated some insights into how the environmental attitudes of the customer can create a different level of engagement in SM, especially in terms of varying value creation level to the company. The study reveals that the higher level of environmental awareness of customer relates to the more willingness of value to be generated to the company. In this study, for cognitive ecological awareness, customers are willing to consume the value. While at the affective level, they are pleased to contribute the value to the company, whereas, for the conative level, they are willing to co-create value with the company.

Finally, a refined conceptual model (Figure 6-3) was developed from empirical data to reflect the relationship between environmental awareness, customer engagement, and value creation to the company in SM. This can be used as a basic framework in further study.

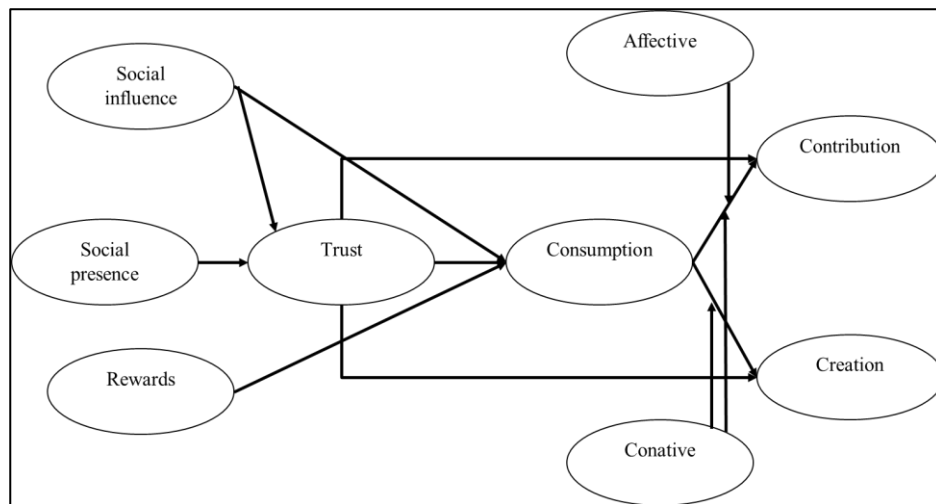


Figure 6-3 A refined conceptual framework of the relationship between environmental awareness, customer engagement, and value creation to the company in SM based on empirical data in this study

6.4 Managerial implications

This study provides important managerial implications for social media marketer of the companies, especially for those who are working in the businesses that are related to the natural environment issues. Overall, the refined conceptual model offers a comprehensive overview of how the environmental awareness of customers related to the customers-brand engagement and value creation to the company. A proposed model which has been developed in this study helps the marketer to clearly understand how to strategic management with their customer in order to build a relationship and encourage them to participate in value co-creation to the company in SM. This is to start by the assurance of customers-brand trust as it is found to be a significant thing for a customer, not only to engage with the company, but it is also crucial for them dedicated their value to the company in social media. To increase the customers brand trust, social presence and social influence were founded to be the antecedence of the trust. Hence, the company should provide an SM platform which enables participation amongst customers as they can perceive their social presence, also, they can influence each other to increase the trust to the company, which resulted in more value to be co-creation to the company. Besides, to maintain the engagement in social media, rewards are found to be a significant factor, hence, marketer and company should justify the suitable rewards

in order to maintain the loyalty and to encourage for those who did not participate in engaging with the company. This complies with the result in an empirical study that the more engagement customer has with the company on SM, the higher level of value to be contributed and created to the company.

In addition to the antecedence of engagement and value co-creation, customers who have an affective attitudinal level of environmental awareness were found to have a higher level of engagement and higher opportunity to contribute to the company on SM. In other words, they have a more possibility of rating product, joining a brand profile on an SNSs, engaging in branded conversations, e.g. on online brand community forums or SNSs and commenting on brand-related, video, audio, pictures. While those who have a conative attitudinal level of environmental awareness will not only get a higher value contribution to the company, they are more willing to co-create value with the company such as publishing a brand-related weblog, uploading brand-related video, audio, pictures, or images, writing brand-related articles, and writing product reviews. On the other hands, those who only have a cognitive level of environmental awareness are found not to increase the participation and value generation in SM based on their environmental perspective.

This proposed model can also be operationalised by supply chain manager in segmenting their customer into those who are accounted as a highly-environmental awareness customer types, in which they are expected not only to consume the contents provided by the company in SM platform, but they also tend to contribute and co-create the value to the company, moderately-environmental awareness customer type, in which they are expected to contribute value to the company in SM platform, and the low- environmental awareness customer types, in which they tend to only consume the contents that company offer on SM platform. The segmentation of customer by this model is useful for supply chain manager in adjusting the company strategy to serve the right needs to the right group, which resulting in getting to the right information to be used in product and service development in order to gain a better supply chain performance later on.

Overall, to better management with the customer in social media in order to get more value to the company, a company should concern on the customers-brand trust issues in SM which can increase by the employment of an SM platform which allows them to verify their identity, also allows them to connect with their social influencer. Also, rewards in

terms of monetary, functional, and psychological should be concerned as it can encourage the customer to be attached to the company. Besides, customer segmentation in terms of environmental awareness of customer needs to be the focus, as the different types of environmental awareness peoples have, the different value to the company will be generated, especially for those company who has a product or services related to the natural environmental issue.

6.5 Research limitations

This study contains some limitations, just like any other research; these are reflected in the methodological design and how this research was conducted.

The conceptual model contains ten constructs which were developed based on literature review and existing theory. However, the constructs in this study are developed based on the customer's side. It should be noted that this study does not consider the external variables, especially in the company's point of view, which may affect the results. This limitation comes to the gaps in which future research can be used to continue further study.

In the development of conceptual model and constructs, although, the author adopted many mechanisms to ensure the validity and reliability of constructs using t-test in the pilot study, and exploratory factor analysis to discover any underlying issues of the constructs and to ensure the accuracy of the measurement items, however, it must be acknowledged that the scope of the SEM phase was limited to a single population group.

To clearly understand this, the population for this research is only focus on the case of Thai-undergraduate student. Hence, any attempt to replicate the study in another population rather than the Thai-undergraduate students, such as different countries, ages, educational levels, or the generalisation of the result in to these different contexts should be made with cautions.

In the generalisability of the results to the whole population, as the population in this study is a large population, many measures are employed to mitigate the bias through the use of random sampling techniques by the cluster sampling techniques together with systematic sampling techniques to ensure that the samples in this study can cover all

characteristics in the population. However, there are still some limitations as the authors set the confidence level for this study at 95 percent. Hence, there is still a chance of sampling error to occur.

The last limitation of this study is that the research was designed to test and validated the conceptual model at a single point in time. Therefore, in order to have a better understanding of the model and increase the level of confidence, a longitudinal study can be carried out to see any significant changes in the results over some time.

6.6 Future research

As the study provided a framework to better understanding the role of environmental awareness on the relationship between customer's engagement and value creation in social media. In doing this, the author explores some questions which are yet to be answered. Furthermore, these questions could be further extended as follows.

1. As this study only scope the research framework on the customer's side, hence a further expanding this framework by conducting research on the company side should be carried out. To do this, the author suggests starting with the question "Are there any constructs especially from the company side that influence between the role of environmental awareness on the relationship between customer's engagement and value creation".
2. As the scope of this study only focuses on the teenager's group of customers, hence, a question to be the further answer is that "Is this environmental awareness on the relationship between customer's engagement and value creation can be adapted to others group of consumers, e.g., for adult, or oldster?.
3. As a propose framework of the relationship between environmental awareness and value creation to the company is quite new, hence, a further studied in this framework in more details should be carried out.
4. Finally, a possible extension may be a replication of this study in another country due to the focus of this study is only Thailand. Hence, a cross-country comparison especially between the developed and developing country will be interesting to compare in order to explore any differences of results from developing and

developed countries in which the constructions which have been developed and tested in this study can be used as a theoretical basis for future work to be built

6.7 Chapter summary

This chapter summarises the research project from various perspectives. First, examine the key findings of this study by reflecting and criticising of the empirical results with the existing knowledge on RQ1 and RQ2. After this, the contributions of this study were demonstrated both from theoretical and practical perspectives. Then the criticism of research limitation is provided. Furthermore, recommend several research directions for future work is suggested.

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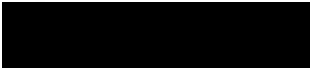
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Appendix A

A permission letter to contacted with Thai university authorities from office of educational affairs under the Thai government United Kingdom

	สำนักงานผู้ดูแลนักเรียนในพระองค์อังกฤษ Office of Educational Affairs 28 Prince's London SW7 1PT
ที่ 55003/ 2,903	
๓ กรกฎาคม 2562	
เรื่อง ขอความอนุเคราะห์ให้เก็บข้อมูลการวิจัย	
เรียน อธิการบดี มหาวิทยาลัยสงขลานครินทร์ วิทยาเขตตรัง	
<p>ด้วย นายชนวีร์ ภักดีใหม่ นักเรียนทุนกระทรวงวิทยาศาสตร์และเทคโนโลยี ตามความต้องการของมหาวิทยาลัยราชภัฏชัยภูมิ กำลังศึกษาระดับปริญญาเอก สาขาวิชา Engineering ภาควิชา Warwick Manufacturing Group (WMG) ณ University of Warwick สหราชอาณาจักร โดยทำวิทยานิพนธ์ในหัวข้อเรื่อง 'A sustainable packaging solution for actors of supply chain' ซึ่งเป็นงานวิจัยที่มีการศึกษาอิทธิพลของความตระหนักต่อสิ่งแวดล้อมที่มีต่อความสัมพันธ์ระหว่างคุณลักษณะของผู้บริโภคและการแสดงออกต่อบริษัททาง social media และเพื่อให้งานวิจัยมีความสมบูรณ์ นายชนวีร์ ภักดีใหม่ จึงประสงค์จะขอข้อมูลจากหน่วยงานของท่านเกี่ยวกับทัศนคติที่มีต่อสิ่งแวดล้อมของนักศึกษาไทย และระดับการใช้งานทางด้าน social media ที่เกี่ยวข้องกับสินค้าและบริการต่างๆ</p> <p>สำนักงานผู้ดูแลนักเรียนในพระองค์อังกฤษ (สนร.) ได้พิจารณาแล้วเห็นว่า ข้อมูลจากหน่วยงานของท่านจะเป็นประโยชน์ต่องานวิจัยของนักเรียน ซึ่งเป็นส่วนหนึ่งของการศึกษาระดับปริญญาเอก จึงขอความอนุเคราะห์ให้นักเรียนผู้ได้เก็บข้อมูลประกอบการทำวิทยานิพนธ์ ตามที่แจ้งขอมา</p> <p>จึงเรียนมาเพื่อโปรดพิจารณา และแจ้งผลให้สำนักงานผู้ดูแลนักเรียนในพระองค์อังกฤษทราบด้วยเพื่อประสานกับนักเรียนต่อไป หรือติดต่อนายชนวีร์ ภักดีใหม่ โดยตรงทางอีเมล cpakdeemail@gmail.com จะขอบคุณยิ่ง</p>	
ขอแสดงความนับถือ	
	
(นางสาวธนิดา เตชะไขวิวัฒน์) อัครราชทูต (ฝ่ายการศึกษา) ประจำสถานเอกอัครราชทูต ณ กรุงลอนดอน	
ฝ่ายนักเรียนทุนรัฐบาลและข้าราชการการศึกษา โทร. +44 (0)20 7584 4538 โทรสาร. +44 (0)20 7823 9896 อีเมล. scholars@oeauk.net	

Appendix B

Example of a letter to request for permission of survey



Dr J. A. Jones Director of Academic Quality

WMG University of Warwick

Gibbet Hill Road Coventry, CV4 7AL, UK

Tel: [REDACTED] Fax: [REDACTED]

Email: [REDACTED]

Dear Vice Rector,

One of my PhD Students, Mr Chonnawee Pukdeemai, is undertaking a study entitled ***“The moderation effect of environmental awareness on the relationship between customer’s engagement and value-creation to the company in social media”***

The aim of his study is to explore the relationship between the antecedent of a customer's characteristics and their level of engagement in social media. He is also exploring whether the level of environmental awareness has an effect on those relationships or not.

The Thai Government supports his work so the focus has to be on Thailand and he has identified university students as a key market for his study. As you are a leading university in Thailand he felt that you may be a suitable place to collect this data. However in order to do so he requires your permission to approach students at your university, this is requirement of obtaining UK ethical approval for his research.

Would you be able to grant him permission to provide you undergraduate students with a questionnaire so he can collect data to complete his thesis?

If you are able to so could you please provide a brief letter stating that you grant permission so that he can take it to our ethics panel to obtain authorisation to proceed.

Thank you in advance.

Yours Faithfully

A large black rectangular box redacting the signature of J.A. Jones.

J.A.Jones

Appendix C

Ethical approval certification



Biomedical and Scientific Research Ethics Committee
Kirby Corner Road
Coventry
CV4 8UW

Monday, 15 July 2019

Mr Chonnawee Pukdeemai
Warwick Manufacturing Group
University of Warwick
Coventry
CV4 7AL

Dear Mr Pukdeemai,

Ethical Application Reference: REGO-2019-2367
Title: The moderating effect of environmental awareness on the relationship between antecedent of customer characteristics and level of engagement in social media

Thank you for submitting your revisions to the Biomedical and Scientific Research Ethics Committee (BSREC) for consideration. We are pleased to advise you that, under the authority delegated to us by the University of Warwick Research Governance and Ethics Committee, **full approval for your project is hereby granted.**

Before conducting your research it is strongly recommended that you complete the on-line Research Integrity training:
www.warwick.ac.uk/ritraining. Support is available from the BSREC Secretary.

In undertaking your study, you are required to comply with the University of Warwick's Research Code of Practice:
https://warwick.ac.uk/services/ris/research_integrity/code_of_practice_and_policies/research_code_of_practice/

You are also required to familiarise yourself with the University of Warwick's Code of Practice for the Investigation of Research Misconduct:
https://warwick.ac.uk/services/ris/research_integrity/research_misconduct/codeofpractice_research_misconduct/

You must ensure that you are compliant with all necessary data protection regulations:
<https://warwick.ac.uk/services/idc>

Please ensure that evidence of all necessary local permissions is provided to BSREC prior to commencing your study.

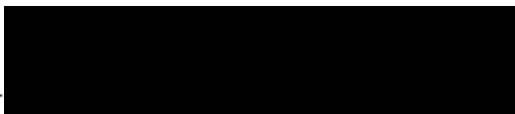
www.warwick.ac.uk

Please also be aware that BSREC grants **ethical approval** for studies. The seeking and obtaining of all other necessary approvals is the responsibility of the investigator.

Any substantial changes to any aspect of the project will require further review by the Committee and the PI is required to notify the Committee as early as possible should they wish to make any such changes. The BSREC Secretary should be notified of any minor amendments to the study.

May I take this opportunity to wish you the very best of luck with this study.

Yours sincerely

pp. 

Dr David Ellard
Chair, Biomedical and Scientific Research Ethics Committee

Appendix D

Example of a permission letter to collected data in Thai university



PRINCE OF SONGKLA UNIVERSITY
Trang Campus
Kaunpring, Muang District, Trang 92000 THAILAND
Tel: 66-7520-1712 Fax: 66-7520-109

MHESI 6805.01/290

7 August 2019

Dear Dr J.A. Jones,

Subject: Acceptance for Mr Chonnawee Pukdeemai's data collection request

With the reference of requesting letter for Mr Chonnawee Pukdeemai's data collection permission, I am very pleased to inform you that we grant him this permission to do the thesis data collection between August 13-16, 2019.

We hope that our students will greatly benefit to the research. Should you have any further queries or need further assistance, please do not hesitate to contact us

Yours sincerely,

Dr. Nipat Powijit



Dean
Faculty of Commerce and Management

E-mail: [Redacted]

Appendix E

Participant Information Leaflet



Participant Information Leaflet for the key informants involving in the engagement with customers of the company and Thai-undergraduate student

Study Title:	The moderation effect of environmental awareness on the relationship between customer's engagement and value-creation to the company in social media
Investigator(s):	Chonnawee Pukdeemai supervised by Assoc. Prof Jeffrey Jones

Introduction

You are invited to take part in a research study. Before you decide, you need to understand why the research is being done and what it would involve for you. Please take the time to read the following information carefully. Talk to others about the study if you wish.

Please ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

Who is organising and funding the study?

This project is not funded by any organisations. It is part of the University course.

What is the study about?

The aim of this study is to explore the relationship between antecedent of customer's characteristics and level of engagement in social media. And whether the level of environmental awareness have an effect of those relationship or not?

What would taking part involve?

You will be informed about the date and time of the survey will be conducted within your organisation. A participant information leaflet and a consent form will be circulated to you beforehand. The forms need to be completed if you decide to take part. Then, the consent form will be returned to me before the survey begin.

Do I have to take part?

No. Participation in this study is completely voluntary and choosing not to take part will not affect you [or your medical care/student grades etc.] in any way. You can also choose to withdraw your

participation at any time, without giving a reason by contacting one of the research team. Further details about withdrawing from the study are provided later on in this document.

What are the possible benefits of taking part in this study?

This study will contribute to the knowledge about customer relationship management by illustrating how the company need to treat their customers, and how to encourage them in order to gain the higher values through the co-creation on social media platform. This study also contributes to the environmental issues by explaining the role of environmental awareness to the engagement level in social media, which will beneficial to the society.

What are the possible disadvantages, side effects or risks, of taking part in this study?

No known side effects. You have the right to withdraw at any time if you feel uncomfortable.

Expenses and payments

You will not be required to make any payments to take part in this study.

Will my taking part be kept confidential?

Yes, questionnaire will be handed-in and collected in person. All collected data will be stored on an encrypted the University of Warwick's internal cloud where the collected data will be shared with my supervisors (Jeffrey Jones). Participants will be given a study number to protect their identity and the code linking this will be stored separately to the research data. In the researcher's dissertation and any future publications, the direct quotes may be used to report the results. However, the reported data will be pseudonymised to protect the original identity of the participants. The pseudonymised data will only be available to the other researchers that will have joint publication with me.

What will happen to the data collected about me?

As a publicly funded organisation, the University of Warwick have to ensure that it is in the public interest when we use personally-identifiable information from people who have agreed to take part in research. This means that when you agree to take part in a research study, such as this, we will use your data in the ways needed to conduct and analyse the research study.

We will be using information from you to undertake this study and will act as the data controller for this study. We are committed to protecting the rights of individuals in line with data protection legislation. The University of Warwick will keep information about you for 2 years after the study has finished

Research data will be **pseudonymised** as quickly as possible after data collection. This means all direct and indirect identifiers will be removed from the research data and will be replaced with a participant number. The key to identification will be stored separately and securely to the research data to safeguard your identity.

Data Sharing

The data will not be shared outside the University for this study.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. The University of Warwick has in place policies and procedures to keep your data safe.

This data may also be used for future research, including impact activities following review and approval by an independent Research Ethics Committee and subject to your consent at the outset of this research project.

For further information, please refer to the University of Warwick Research Privacy Notice which is available here: <https://warwick.ac.uk/services/idc/dataprotection/privacynotices/researchprivacynotice> or by contacting the Information and Data Compliance Team at GDPR@warwick.ac.uk.

What will happen if I don't want to carry on being part of the study?

Participation in this study is entirely voluntary. Refusal to participate will not affect you in any way. If you decide to take part in the study, you will need to sign a consent form, which states that you have given your consent to participate.

If you agree to participate, you may nevertheless withdraw from the study at any time without affecting you in any way. You have the right to withdraw from the study completely and decline any further contact by study staff after you withdraw. If you withdraw from the study, it will often not be possible to withdraw your data which has already been collected, after it has been anonymised. To safeguard your rights, we will use the minimum personally-identifiable information possible and keep the data secure in line with the University's Information and Data Compliance policies.

What will happen to the results of the study?

Prior to any distribution of the results (in any of the following methods) they will be discussed with the person in charge to establish whether the data is restricted or not. It is anticipated that none of the data will be restricted given the nature of the project and the type data that is involved.

The results will be used and discussed in the researcher's dissertation as part of the program. The results will also be used in any journals that the researcher plans to publish, and it may be discussed at any conferences or seminars that the researcher will attend.

Who has reviewed the study?

This study has been reviewed and given favourable opinion by the University of Warwick's Biomedical & Scientific Research Ethics Committee (BSREC):

Who should I contact if I want further information?

If you have any questions about any aspect of the study, or your participation in it, not answered by this participant information leaflet, please contact:

Chonnawee Pukdeemai Email: [REDACTED] Tel: [REDACTED]

Jeffrey Jones Email: [REDACTED] Tel: [REDACTED]

Who should I contact if I wish to make a complaint?

Any complaint about the way you have been dealt with during the study or any possible harm you might have suffered will be addressed. Please address your complaint to the person below, who is a senior University of Warwick official entirely independent of this study:

Head of Research Governance

Research & Impact Services

University House

University of Warwick

Coventry

CV4 8UW

Email: researchgovernance@warwick.ac.uk

Tel: 024 76 522746

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer, Anjeli Bajaj, Information and Data Director who will investigate the matter: DPO@warwick.ac.uk.

If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO).

Thank you for taking the time to read this Participant Information Leaflet

Appendix F

Consent form



Title of Project: The moderation effect of environmental awareness on the relationship between customer's engagement and value-creation to the company in social media

Name of Researcher(s): Chonnawee Pukdeemai.

Academic supervisor: Assoc. Prof. Jeffrey Jones

*** Please check all boxes**

1. I confirm that I have read and understand the information sheet (version 1, 28/02/19) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical, social care, education, or legal rights* being affected. ☐
3. I understand that relevant sections of my medical notes and* data collected during the study, may be looked at by individuals from The University of Warwick, from regulatory authorities, where it is relevant to my taking part in this study. I give permission for these individuals to have access to my data. ☐
4. I agree to the interview being recorded. ☐
5. I am happy for my data to be used in future research. ☐
6. I agree to take part in the above study. ☐

Name of Person
taking consent

Date

Signature

Appendix G

Questionnaire: The Influence of environmental awareness on the relationship between consumer characteristics and social media expression

This questionnaire consists of 54 questions, 5 pages. Please answer all questions for the correct measurement of the research. The estimated answer time is 15 minutes. Thank you for your cooperation in providing information here.

This questionnaire is a part of a research thesis of a PhD student at Supply Chain management research group, WMG, university of Warwick University, United Kingdom. Therefore, would like to ask for cooperation in answering the questionnaires as detailed in this questionnaire. The researcher asks you to fill out the actual questions. And thank you for providing the information here

Part 1 General questionnaire about respondents

Suggestion: Please answer the questionnaire. By choosing an option that matches the answer and your opinion the most

1. Gender

☐ Male

☐ Female

☐ Preferred not to mention

2. Year of study

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ Preferred not to mention

3. Faculty

4. University

Part: 2 Questions related to customer's characteristics

In this section of the questionnaire, you are asked for a response to a series of statements about your characteristics on social media. For questions 5-24, responses will indicate the degree to which you agree with each statement.

Statements	Strongly disagree (1)	disagree (2)	Slightly disagree (3)	Neutral (4)	Slightly agree (5)	agree (6)	Strongly agree (7)
5. Direct monetary rewards are expected for active participation in brand social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Indirect monetary rewards are expected for active participation in brand social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Psychological rewards are expected for active participation in brand social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Functional rewards are expected for active participation in brand social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Social rewards are expected for active participation in brand social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I trust the information shared with me by people I know through social media channels	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Companies who are well known in social media are credible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I feel a sense of loyalty with companies I know via social media using	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I trust the data generated by the company more than the data provided by individual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I worry about how the company will use my data provided on social media in a harmful way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Group of people who influence my behaviors would think that I should use Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Group of people who are important to me would think that I should use Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Statements	Strongly disagree (1)	disagree (2)	Slightly disagree (3)	Neutral (4)	Slightly agree (5)	agree (6)	Strongly agree (7)
17. How attached are you to the group you mentioned above?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I am a valuable member of the group that I mentioned above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I am an important member of the group that I mentioned above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. There is a sense of human contact in Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. There is a sense of personness in Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. There is a sense of sociability in Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. There is a sense of human warmth in Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. There is a sense of human sensitivity in Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part: 3 Questions related to environmental awareness

In this section of the questionnaire, you are asked for a response to a series of statements about your knowledge and opinion on environmental issue. For questions 25-39, responses will indicate the degree to which you agree with each statement.

Statements	Strongly disagree (1)	disagree (2)	Slightly disagree (3)	Neutral (4)	Slightly agree (5)	agree (6)	Strongly agree (7)
25. Destruction of forests will cause biological imbalances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Alternative energy, e.g. solar energy can be utilized in place of electricity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Unleaded petrol is better than leaded petrol as it is less harmful to the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Using public transport can help alleviate air pollution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Should not promote the use of disposable items only because of convenience to consumers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Statements	Strongly disagree (1)	disagree (2)	Slightly disagree (3)	Neutral (4)	Slightly agree (5)	agree (6)	Strongly agree (7)
30. It frightens me to think that much of the food I eat is contaminated with pesticides.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. It genuinely infuriates me to think that the government does not do more to help control pollution of the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. I become incensed when I think about the harm being done to plant and animal life by pollution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. When I think of the ways industries are polluting, I get frustrated and angry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. I am bothered by so-called "noise pollution."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. I would be willing to ride a bicycle or take the bus to work to reduce air pollution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. I would be willing to use a rapid transit system to help reduce air pollution.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. I would donate a day's pay to a foundation to help improve the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. I would be willing to stop buying products from companies guilty of polluting the environment, even though it might be inconvenient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. I am happy to write to authorities' members every week about environmental issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Part: 4 Questions related to level of engagement in social media

In this section of the questionnaire, you are asked for a response to a series of statements about how often you interact on social media with the company. For questions 40-54, responses will indicate the degree to how often you do with each statement.

Statements	Strongly disagree (1)	disagree (2)	Slightly disagree (3)	Neutral (4)	Slightly agree (5)	agree (6)	Strongly agree (7)
40. I read post related to brand on social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. I read fan pages related to brand on social media sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. I watch picture/graphics related to brand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. I follow videos related to brand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. I follow official Facebook fan pages relate to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. I comment on videos related to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46. I comment on posts related to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. I comment on picture/graphics related to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. I shared brand X related to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. I like posts related to brand on social network sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. I initiate posts related to brand on my personal Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. I post picture/graphics related to brand on social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. I write reviews related to brand on social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
53. I write posts related to Brand on Facebook page	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. I post videos that show brand on social media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you to all the respondents for taking the time to answer this questionnaire.

Researcher

Appendix H

A certified of accuracy in translation of the questionnaire

แบบสอบถามเรื่อง อิทธิพลของความตระหนักต่อสิ่งแวดล้อมที่มีต่อ
ความสัมพันธ์ระหว่างคุณลักษณะของผู้บริโภคและการแสดงออกต่อบริษัท
ทาง Social Media

แบบสอบถามชุดนี้ ประกอบด้วยการจำนวน 54 คำถาม 8 หน้า กรุณาตอบให้ครบทุกคำถามเพื่อการวิเคราะห์
ถูกต้องของงานวิจัย เวลาที่ใช้ในการตอบคำถามโดยประมาณคือ ประมาณ 30-40 นาที ขอขอบคุณคุณท่านในความร่วมมือนี
ให้ข้อมูล มา ณ ที่นี้

แบบสอบถามชุดนี้เป็นเอกสารประกอบเครื่องมือการวิจัยของนักศึกษาระดับปริญญาโท คณะ วิศวกรรมศาสตร์ สาขา Supply
Chain Management มหาวิทยาลัย Warwick ประเทศ สหราชอาณาจักร จึงได้ขอความร่วมมือในการตอบ
แบบสอบถามด้วยระยะเวลาที่ปรากฏในแบบสอบถามนี้ ผู้วิจัยขอความกรุณาให้ท่านตอบคำถามตามความเป็นจริง
และขอขอบพระคุณท่านที่ให้อบรมมา ณ ที่นี้

ส่วนที่ 1 แบบสอบถามข้อมูลทั่วไปเกี่ยวกับผู้ตอบแบบสอบถาม

คำถามนำ: กรุณาตอบแบบสอบถาม โดยเลือกตัวอักษร ที่ตรงกับคำตอบ และความคิดเห็นของท่านมากที่สุด

1. เพศ


☐ ชาย ☐ หญิง ☐ ไม่ประสงค์จะระบุ

2. ชั้นปีที่กำลังศึกษา

☐ ปีที่ 1 ☐ ปีที่ 2 ☐ ปีที่ 3
☐ ปีที่ 4 ☐ ปีที่ 5 ☐ ปีที่ 6
☐ ไม่ประสงค์จะระบุ

3. คณะที่กำลังศึกษา

4. มหาวิทยาลัยที่กำลังศึกษา

 Certified Correct Translation
[Redacted Signature]
IPanisa Sripaonnyai
Translator
ผู้แปล
หน้าที่ 1/6

แบบสอบถามเรื่อง อิทธิพลของความตระหนักต่อสิ่งแวดล้อมที่มีต่อ ความสัมพันธ์ระหว่างคุณลักษณะของผู้บริโภคและการแสดงออกต่อ บริษัททาง Social Media

แบบสอบถามชุดนี้ ประกอบด้วยคำถามจำนวน 54 คำถาม 6หน้ากรุณาตอบให้ครบทุกคำถามเพื่อการวัดผลที่
ถูกต้องของงานวิจัย เวลาที่ใช้ในการตอบคำถามโดยประมาณคือ 15นาที ขอขอบพระคุณท่านในความร่วมมือให้
ข้อมูล มา ณ ที่นี้

แบบสอบถามชุดนี้เป็นเอกสารประกอบการวิจัยของนักศึกษาระดับปริญญาเอกคณะ วิศวกรรมศาสตร์ สาขา Supply Chain Management
มหาวิทยาลัย Warwick ประเทศ สหราชอาณาจักร จึงใคร่ขอความร่วมมือในการตอบแบบสอบถามดังรายละเอียดที่ปรากฏในแบบสอบถามนี้ ผู้วิจัย
ขอความกรุณาให้ท่านกรอกคำถามตามความเป็นจริง และขอขอบพระคุณท่านที่ให้ข้อมูลมา ณ ที่นี้

ส่วนที่ 1 แบบสอบถามข้อมูลทั่วไปเกี่ยวกับผู้ตอบแบบสอบถาม

คำแนะนำกรุณาตอบแบบสอบถาม โดยเลือกตัวเลือก ที่ตรงกับคำตอบ และความคิดเห็นของท่านมาก :
ที่สุด

.1เพศ

☐ ชาย

☐ หญิง

☐ ไม่ประสงค์จะระบุ

.2ชั้นปีที่กำลังศึกษา

☐ ปีที่1

☐ ปีที่2

☐ ปีที่3

☐ ปีที่4

☐ ปีที่5

☐ ปีที่6

☐ ไม่ประสงค์จะระบุ

3. คณะที่กำลังศึกษา

4. มหาวิทยาลัยที่กำลังศึกษา

ส่วนที่ 2 แบบสอบถามเพื่อวิเคราะห์ลักษณะของลูกค้า

คำแนะนำท่านมีความคิดเห็นต่อข้อความนี้อย่างไร กรุณาตอบแบบสอบถาม โดยเลือก 24-5 คำถามข้อที่ :
คำตอบตามลำดับความคิดเห็นที่ตรงกับความเห็นของท่าน

ข้อความ	ไม่เห็นด้วยอย่างยิ่ง (1)	ไม่เห็นด้วย (2)	ไม่เห็นด้วย นิดหน่อย (3)	เห็นเป็นกลาง (4)	เห็นด้วย นิดหน่อย (5)	เห็นด้วย (6)	เห็นด้วยอย่างยิ่ง (7)
.5 ผลตอบแทนทางตรงในรูปแบบตัวเงินมีผลต่อการมีส่วนร่วมในการติดต่อสื่อสารกับบริษัทผู้ผลิตสินค้าและบริการทาง Social Media	○	○	○	○	○	○	○
.6 ผลตอบแทนทางอ้อมในรูปแบบตัวเงินมีผลต่อการมีส่วนร่วมในการติดต่อสื่อสารกับบริษัทผู้ผลิตสินค้าและบริการทาง Social Media	○	○	○	○	○	○	○
7. ผลตอบแทนทางจิตใจมีผลต่อการมีส่วนร่วมในการติดต่อสื่อสารกับบริษัทผู้ผลิตสินค้าและบริการทาง Social Media	○	○	○	○	○	○	○
8. ประโยชน์ทางด้านกายภาพร่วมมีผลต่อการมีส่วนร่วมในการติดต่อสื่อสารกับบริษัทผู้ผลิตสินค้าและบริการทาง Social Media	○	○	○	○	○	○	○
.9 ผลตอบแทนต่อสังคมมีผลต่อการมีส่วนร่วมในการติดต่อสื่อสารกับบริษัทผู้ผลิตสินค้าและบริการทาง Social Media	○	○	○	○	○	○	○
.10 ฉันเชื่อข้อมูลที่แบ่งปันกับฉันโดยคนที่ฉันรู้จักผ่านช่องทางสื่อสังคมออนไลน์	○	○	○	○	○	○	○
11. บริษัทที่มีชื่อเสียงใน Social Media มีความน่าเชื่อถือ	○	○	○	○	○	○	○
12. ฉันรู้สึกถึงความภาคภูมิใจต่อบริษัทที่ฉันรู้จักผ่าน Social Media	○	○	○	○	○	○	○
.13 ฉันเชื่อถือข้อมูลที่สร้างโดย บริษัท มากกว่าข้อมูลที่ให้ไว้โดยบุคคลทั่วไป	○	○	○	○	○	○	○
14 . ฉันกังวลเกี่ยวกับวิธีที่บริษัทจะใช้ข้อมูลของฉันที่ใหไว้ใน Social Media ในทางอันตราย	○	○	○	○	○	○	○
15 กลุ่มคนที่มีอิทธิพลต่อพฤติกรรมของฉันจะคิดว่าฉันควรใช้ Facebook	○	○	○	○	○	○	○

ข้อความ	ไม่เห็น ด้วย อย่าง ยิ่ง (1)	ไม่เห็น ด้วย (2)	ไม่เห็น ด้วย นิด หน่อย (3)	เห็น เป็น กลาง (4)	เห็น ด้วย นิด หน่อย (5)	เห็น ด้วย (6)	เห็น ด้วย อย่าง ยิ่ง (7)
16. กลุ่มคนที่มีความสำคัญต่อฉันจะคิดว่าฉันควรใช้ Facebook	○	○	○	○	○	○	○
17. ระดับความใกล้ชิดของคุณกับกลุ่มที่กล่าวถึง	○	○	○	○	○	○	○
18. ฉันเป็นสมาชิกที่มีคุณค่าของกลุ่มที่ฉันกล่าวถึงข้างต้น	○	○	○	○	○	○	○
19. ฉันเป็นสมาชิกคนสำคัญของกลุ่มที่ฉันกล่าวถึงข้างต้น	○	○	○	○	○	○	○
20. คุณรู้สึกถึงการติดต่อกับผู้คนผ่านการใช้ Facebook	○	○	○	○	○	○	○
21. คุณรู้สึกถึงความมีตัวตนของคนใน Facebook	○	○	○	○	○	○	○
22. คุณรู้สึกถึงการเข้าถึงผ่านการใช้ Facebook	○	○	○	○	○	○	○
23. คุณรู้สึกถึงความอบอุ่นของเพื่อนมนุษย์ผ่านการใช้ Facebook	○	○	○	○	○	○	○
24. คุณรู้สึกถึงความอ่อนไหวต่อเพื่อนมนุษย์ผ่านการใช้ Facebook	○	○	○	○	○	○	○

ส่วนที่ 3 แบบสอบถามเพื่อวิเคราะห์ถึงความตระหนักต่อสิ่งแวดล้อม

คำแนะนำ คำถามข้อที่ :25-39 ท่านมีความคิดเห็นต่อข้อควมนี้อย่างไร กรุณาตอบแบบสอบถาม โดยเลือกคำตอบตามลำดับความคิดเห็นที่ตรงกับความเห็นของท่าน

ข้อความ	ไม่เห็น ด้วย อย่าง ยิ่ง (1)	ไม่เห็น ด้วย (2)	ไม่เห็น ด้วย นิด หน่อย (3)	เห็น เป็น กลาง (4)	เห็น ด้วย นิด หน่อย (5)	เห็น ด้วย (6)	เห็น ด้วย อย่าง ยิ่ง (7)
25. การทำลายป่าไม่ทำให้เกิดความไม่สมดุลทางชีวภาพ	○	○	○	○	○	○	○
26. พลังงานทางเลือกเช่น พลังงานแสงอาทิตย์สามารถใช้แทนพลังงานไฟฟ้าได้	○	○	○	○	○	○	○
27. น้ำมันไร้สารตะกั่วที่ดีกว่าน้ำมันเบนซินที่มีสารตะกั่ว เนื่องจากเป็นอันตรายต่อสิ่งแวดล้อมน้อยกว่า	○	○	○	○	○	○	○

ข้อความ	ไม่เห็น ด้วย อย่าง ยิ่ง (1)	ไม่เห็น ด้วย (2)	ไม่เห็น ด้วย นิด หน่อย (3)	เห็น เป็น กลาง (4)	เห็น ด้วย นิด หน่อย (5)	เห็น ด้วย (6)	เห็น ด้วย อย่าง ยิ่ง (7)
28. ระบบขนส่งสาธารณะช่วยลดมลพิษทางอากาศ	○	○	○	○	○	○	○
29. ไม่ควรส่งเสริมในการใช้สิ่งของใช้แล้วทิ้งเพียงเพราะความสะดวกต่อผู้บริโภค	○	○	○	○	○	○	○
30. ฉันทักลึ่งเมื่อคิดว่าอาหารที่ฉันกินส่วนใหญ่ปนเปื้อนยาฆ่าแมลง	○	○	○	○	○	○	○
31. ฉันทกรรและคิดว่ารัฐบาลไม่ได้ทำอะไรมากเพื่อช่วยควบคุมมลพิษของสิ่งแวดล้อม	○	○	○	○	○	○	○
32. ฉันทไม่พอใจเมื่อนึกถึงการก่อดมลพิษของโรงงาน	○	○	○	○	○	○	○
33. ฉันทกรรเมื่อนึกถึงความเสี่ยงที่เกิดขึ้นกับพืชและสัตว์โดยมลพิษ	○	○	○	○	○	○	○
34. ฉันทปวดหัวกับ "มลพิษทางเสียง"	○	○	○	○	○	○	○
35. ฉันทยินดีที่จะขี่จักรยานหรือนั่งรถบัสไปทำงานเพื่อลดมลพิษทางอากาศ	○	○	○	○	○	○	○
36. ฉันทยินดีที่จะใช้ระบบขนส่งมวลชนเพื่อช่วยลดมลพิษทางอากาศ	○	○	○	○	○	○	○
37. ฉันทยินดีบริจาคให้กับการพัฒนาสภาพแวดล้อม	○	○	○	○	○	○	○
38. ฉันทยินดีหยุดการซื้อสินค้าจากบริษัทที่มีความผิดในการสร้างมลภาวะแม้จะไม่ได้ได้รับความสะดวกก็ตาม	○	○	○	○	○	○	○
39. ฉันทยินดีเขียนถึงสมาชิกสภาของฉันททุกสัปดาห์เกี่ยวกับปัญหาสิ่งแวดล้อม	○	○	○	○	○	○	○

ส่วนที่ 4 แบบสอบถามเพื่อวิเคราะห์ถึงระดับความมีส่วนร่วมใน Social Media

คำแนะนำ ท่านมีระดับความถี่ในการมีส่วนร่วมใน 54-40 คำถามข้อที่ :Social Media ที่มีต่อสถานการณ์ในข้อความเหล่านี้ กรุณาตอบแบบสอบถาม โดยเลือกคำตอบตามลำดับความถี่ที่ตรงกับความเห็นของท่าน

ข้อความ	ไม่เคย (1)	น้อย มาก (2)	ค่อนข้าง น้อย (3)	บางครั้ง (4)	ค่อนข้าง บ่อย (5)	บ่อย มาก (6)	ตลอด ทุกครั้ง (7)
.40 ฉันอ่านโพสต์ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.41 ฉันติดตาม Fan page ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.42ฉันดูรูปภาพและกราฟิก ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.43ฉันติดตามวิดีโอที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.44ฉันติดตาม Facebook official pageของบริษัทผู้ผลิตสินค้าและบริการ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.45ฉันแสดงความคิดเห็นในวิดีโอที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.46 ฉันแสดงความคิดเห็นต่อโพสต์ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.47 ฉันแสดงความคิดเห็นต่อรูปภาพและกราฟิกที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
.48ฉันแชร์โพสต์ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. ฉันกดขึ้นชอบโพสต์ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. ฉันสร้างโพสต์ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการในFacebookส่วนตัวของฉัน	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. ฉันโพสต์รูปภาพและกราฟิก ที่เกี่ยวข้องกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ข้อความ	ไม่เคย (1)	น้อย มาก (2)	ค่อนข้าง น้อย (3)	บางครั้ง (4)	ค่อนข้าง บ่อย (5)	บ่อย มาก (6)	ตลอด ทุกครั้ง (7)
52. ฉันเขียนรีวิวเกี่ยวกับบริษัทผู้ผลิตสินค้าและบริการใน Social Media	○	○	○	○	○	○	○
53. ฉันโพสต์เกี่ยวกับบริษัทผู้ผลิตสินค้าและบริการใน Facebook สาธารณะ	○	○	○	○	○	○	○
54. ฉันโพสต์วิดีโอที่สื่อถึงบริษัทผู้ผลิตสินค้าและบริการใน Social Media	○	○	○	○	○	○	○

ขอขอบพระคุณผู้ตอบแบบสอบถามทุกท่านที่สละเวลาในการตอบ
แบบสอบถามในครั้งนี้

ผู้วิจัย

Appendix I

A complete result for paired t-test

Pair	Variables	Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence		t	df	Sig. (2-tailed)
					Lower	Upper			
1	Reward1Th - Reward1En	0.140	0.639	0.097	-0.057	0.336	1.431	42	0.160
2	Reward2Th - Reward2En	0.093	1.171	0.179	-0.267	0.454	0.521	42	0.605
3	Reward3Th - Reward3En	-0.023	0.266	0.041	-0.105	0.059	-0.573	42	0.570
4	Reward4Th - Reward4En	0.093	0.570	0.087	-0.082	0.268	1.071	42	0.290
5	Reward5Th - Reward5En	-0.023	1.144	0.174	-0.375	0.329	-0.133	42	0.895
6	Trust1Th - Trust1En	-0.047	1.308	0.200	-0.449	0.356	-0.233	42	0.817
7	Trust2Th - Trust2En	-0.070	1.223	0.186	-0.446	0.307	-0.374	42	0.710
8	Trust3Th - Trust3En	-0.209	1.146	0.175	-0.562	0.143	-1.198	42	0.238
9	Trust4Th - Trust4En	0.116	1.096	0.167	-0.221	0.453	0.696	42	0.490
10	Trust5Th - Trust5En	-0.116	0.905	0.138	-0.395	0.162	-0.842	42	0.404
11	SocInf1Th - SocInf1En	0.116	0.697	0.106	-0.098	0.331	1.094	42	0.280
12	SocInf2Th - SocInf2En	0.256	1.093	0.167	-0.081	0.592	1.535	42	0.132
13	SocInf3Th - SocInf3En	0.279	1.098	0.167	-0.059	0.617	1.666	42	0.103
14	SocInf4Th - SocInf4En	0.070	0.632	0.096	-0.125	0.264	0.724	42	0.473
15	SocInf5Th - SocInf5En	0.070	0.632	0.096	-0.125	0.264	0.724	42	0.473
16	Soc.Pres1Th - Soc.Pres1En	0.233	0.972	0.148	-0.067	0.532	1.569	42	0.124
17	Soc.Pres2Th - Soc.Pres2En	0.070	0.507	0.077	-0.086	0.226	0.903	42	0.372
18	Soc.Pres3Th - Soc.Pres3En	-0.186	0.982	0.150	-0.488	0.116	-1.242	42	0.221
19	Soc.Pres4Th - Soc.Pres4En	0.233	1.043	0.159	-0.088	0.553	1.462	42	0.151
20	Soc.Pres5Th - Soc.Pres5En	0.349	1.343	0.205	-0.065	0.762	1.703	42	0.096
21	Cog.1Th - Cog.1En	0.070	0.258	0.039	-0.010	0.149	1.775	42	0.083
22	Cog.2Th - Cog.2En	0.047	1.068	0.163	-0.282	0.375	0.286	42	0.777
23	Cog.3Th - Cog.3En	-0.093	0.921	0.140	-0.376	0.190	-0.662	42	0.511
24	Cog.4Th - Cog.4En	-0.093	0.366	0.056	-0.206	0.020	-1.666	42	0.103
25	Cog.5Th - Cog.5En	-0.023	0.886	0.135	-0.296	0.249	-0.172	42	0.864
26	Affect.1Th - Affect.1En	-0.209	0.861	0.131	-0.474	0.056	-1.595	42	0.118
27	Affect.2Th - Affect.2En	-0.163	1.233	0.188	-0.542	0.217	-0.866	42	0.392
28	Affect.3Th - Affect.3En	-0.256	1.590	0.242	-0.745	0.234	-1.055	42	0.297
29	Affect.4Th - Affect.4En	-0.023	0.152	0.023	-0.070	0.024	-1.000	42	0.323
30	Affect.5Th - Affect.5En	-0.023	0.344	0.052	-0.129	0.083	-0.443	42	0.660
31	Conat.1Th - Conat.1En	0.233	1.109	0.169	-0.109	0.574	1.375	42	0.176
32	Conat.2Th - Conat.2En	0.116	1.117	0.170	-0.228	0.460	0.683	42	0.499
33	Conat.3Th - Conat.3En	0.116	0.544	0.083	-0.051	0.284	1.402	42	0.168
34	Conat.4Th - Conat.4En	0.023	0.859	0.131	-0.241	0.288	0.178	42	0.860
35	Conat.5Th - Conat.5En	0.070	0.258	0.039	-0.010	0.149	1.775	42	0.083
36	Consump.1Th - Consump.1En	0.047	0.213	0.032	-0.019	0.112	1.431	42	0.160
37	Consump.2Th - Consump.2En	0.047	0.872	0.133	-0.222	0.315	0.350	42	0.728
38	Consump.3Th - Consump.3En	0.116	1.005	0.153	-0.193	0.426	0.759	42	0.452
39	Consump.4Th - Consump.4En	0.093	0.781	0.119	-0.147	0.333	0.781	42	0.439
40	Consump.5Th - Consump.5En	0.070	1.142	0.174	-0.282	0.421	0.401	42	0.691
41	Contrib.1Th - Contrib.1En	0.047	0.486	0.074	-0.103	0.196	0.628	42	0.533
42	Contrib.2Th - Contrib.2En	0.023	1.035	0.158	-0.295	0.342	0.147	42	0.884
43	Contrib.3Th - Contrib.3En	0.070	0.338	0.052	-0.034	0.174	1.355	42	0.183
44	Contrib.4Th - Contrib.4En	-0.047	0.305	0.047	-0.140	0.047	-1.000	42	0.323
45	Contrib.5Th - Contrib.5En	0.372	1.235	0.188	-0.008	0.752	1.976	42	0.055
46	Creat.1Th - Creat.1En	0.163	0.754	0.115	-0.069	0.395	1.416	42	0.164
47	Creat.2Th - Creat.2En	0.209	1.186	0.181	-0.156	0.574	1.157	42	0.254
48	Creat.3Th - Creat.3En	0.093	0.811	0.124	-0.157	0.343	0.752	42	0.456
49	Creat.4Th - Creat.4En	0.070	0.258	0.039	-0.010	0.149	1.775	42	0.083
50	Creat.5Th - Creat.5En	0.279	1.315	0.201	-0.126	0.684	1.391	42	0.171

Appendix J

A correlation for paired t-test

No	Variables	N	Correlation	Sig.	No	Variables	N	Correlation	Sig.
1	Reward1Th & Reward1En	43	0.941	0.000	26	Affect.1Th & Affect.1En	43	0.834	0.000
2	Reward2Th & Reward2En	43	0.753	0.000	27	Affect.2Th & Affect.2En	43	0.767	0.000
3	Reward3Th & Reward3En	43	0.989	0.000	28	Affect.3Th & Affect.3En	43	0.658	0.000
4	Reward4Th & Reward4En	43	0.949	0.000	29	Affect.4Th & Affect.4En	43	0.997	0.000
5	Reward5Th & Reward5En	43	0.782	0.000	30	Affect.5Th & Affect.5En	43	0.985	0.000
6	Trust1Th & Trust1En	43	0.678	0.000	31	Conat.1Th & Conat.1En	43	0.684	0.000
7	Trust2Th & Trust2En	43	0.712	0.000	32	Conat.2Th & Conat.2En	43	0.803	0.000
8	Trust3Th & Trust3En	43	0.822	0.000	33	Conat.3Th & Conat.3En	43	0.953	0.000
9	Trust4Th & Trust4En	43	0.809	0.000	34	Conat.4Th & Conat.4En	43	0.787	0.000
10	Trust5Th & Trust5En	43	0.845	0.000	35	Conat.5Th & Conat.5En	43	0.977	0.000
11	SocInf1Th & SocInf1En	43	0.912	0.000	36	Consump.1Th & Consump.1En	43	0.981	0.000
12	SocInf2Th & SocInf2En	43	0.736	0.000	37	Consump.2Th & Consump.2En	43	0.792	0.000
13	SocInf3Th & SocInf3En	43	0.755	0.000	38	Consump.3Th & Consump.3En	43	0.728	0.000
14	SocInf4Th & SocInf4En	43	0.902	0.000	39	Consump.4Th & Consump.4En	43	0.846	0.000
15	SocInf5Th & SocInf5En	43	0.914	0.000	40	Consump.5Th & Consump.5En	43	0.703	0.000
16	Soc.Pres1Th & Soc.Pres1En	43	0.836	0.000	41	Contrib.1Th & Contrib.1En	43	0.970	0.000
17	Soc.Pres2Th & Soc.Pres2En	43	0.945	0.000	42	Contrib.2Th & Contrib.2En	43	0.867	0.000
18	Soc.Pres3Th & Soc.Pres3En	43	0.814	0.000	43	Contrib.3Th & Contrib.3En	43	0.982	0.000
19	Soc.Pres4Th & Soc.Pres4En	43	0.820	0.000	44	Contrib.4Th & Contrib.4En	43	0.988	0.000
20	Soc.Pres5Th & Soc.Pres5En	43	0.722	0.000	45	Contrib.5Th & Contrib.5En	43	0.709	0.000
21	Cog.1Th & Cog.1En	43	0.971	0.000	46	Creat.1Th & Creat.1En	43	0.937	0.000
22	Cog.2Th & Cog.2En	43	0.480	0.001	47	Creat.2Th & Creat.2En	43	0.784	0.000
23	Cog.3Th & Cog.3En	43	0.574	0.000	48	Creat.3Th & Creat.3En	43	0.911	0.000
24	Cog.4Th & Cog.4En	43	0.899	0.000	49	Creat.4Th & Creat.4En	43	0.991	0.000
25	Cog.5Th & Cog.5En	43	0.720	0.000	50	Creat.5Th & Creat.5En	43	0.819	0.000