GREEN SUPPORT AND THE USE OF INFORMATION TECHNOLOGY PRODUCTS

PAKVALIT KURKOON

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF DOCTORAL OF
PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2017

GREEN SUPPORT AND THE USE OF INFORMATION TECHNOLOGY PRODUCTS

PAKVALIT KURKOON

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTORAL OF PHILOSOPHY PROGRAM IN BUSINESS ADMINISTRATION
FACULTY OF BUSINESS ADMINISTRATION
RAJAMANGALA UNIVERSITY OF TECHNOLOGY THANYABURI
ACADEMIC YEAR 2017

Dissertation Title	Green Support and the Use of Information Technology Products
Name-Surname	Mr. Pakvalit Kurkoon
Program	Business Administration
Dissertation Advisor	Associate Professor Daranee Pimchangthong, D.B.A.
Dissertation Co-advisor	Associate Professor Veera Boonjing, Ph.D.
Academic Year	2017

DISSERTATION COMMITTEE

……..…..……. Chairman
(Associate Professor Kanibhatti Nitirojntanad, D.B.A.)

…….……. Committee
(Associate Professor Arunee Intrapairot, Ph.D.)

…….……. Committee
(Assistant Professor Natnarong Jaturat, Ph.D.)

…….……. Committee
(Associate Professor Veera Boonjing, Ph.D.)

…….……. Committee
(Associate Professor Daranee Pimchangthong, D.B.A.)

Approved by the Faculty of Business Administration Rajamangala University of Technology Thanyaburi in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

……..……..……..…… Dean of Faculty of Business Administration
(Assistant Professor Nartraphee Chaimongkol, Ph.D.)
November 7, 2017

Dissertation Title	Green Support and the Use of Information Technology Products
Name-Surname	Mr. Pakvalit Kurkoon
Program	Business Administration
Dissertation Advisor	Associate Professor Daranee Pimchangthong, D.B.A.
Dissertation Co-advisor	Associate Professor Veera Boonjing, Ph.D.
Academic Year	2017

ABSTRACT

These days, the seemingly endless usage and manufacturing of Information Technology (IT) products are one of the main factors that intensify environmental problems. Many concerned citizens believed that green IT products and green businesses are vital for sustainable development. It is only by realizing how to encourage both individual and organization that would help establishing sustainable green society. Hence, a framework for prediction is needed.

This paper proposed to develop a framework that can predict consumer intention to support IT products and businesses that were considered eco-friendly. Diffusion of Innovation, Information System Success, and Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) were mainly adopted in the framework development. Structural Equation Modeling (SEM) was also employed for hypothesis testing.

The results showed that environmental concern & habit has the strongest influence factor on the intention to support green IT products and business. It was followed by perceived green benefits, resource sacrifices, perceived green organization policy and noticeability. Finally, additional analysis confirmed that perceived green benefits were good mediator between resource sacrifices and environmental concerns and habits.

Keywords: environmental friendly, information technology product, eco-friendly, green image, environmental concern, green IT

Acknowledgements

I sincerely thank Assoc. Prof. Dr. Daranee Pimchangthong and Assoc. Prof. Dr. Veera Boonjing, who are the dissertation advisor and co-advisor, respectively, for the greatest and kindest instructions, which brought this research a success. I also respectfully thank honorable chairman and committees, which includes Assoc. Prof. Dr. Kanibhatti Nitirojntanad, Asst. Prof. Dr. Natnarong Jaturat and Assoc. Prof. Dr. Arunee Intrapairoth for worthful knowledge of ameliorations.

I unfeignedly thank Joseph Kenrick, who is a teacher and a friend, for all robust English lessons, grammatical proved reading, correction of pronunciation and business management trivia. I reverentially thank Dr. Chalermsak Lertwongsatien for introduction of Diffusion of Innovation, a theoretical book. I also truly thank Asst. Prof. Dr. James Gaskin for all kind replies in YouTube for solutions of statistical problems.

I genuinely thank my family for uncountable supports, and thank all respondents to lubricate the statistical analysis. Moreover, specially thanks to Doctoral of Business Administration program of Rajamangala University of Technology Thanyaburi, and all personnel for kind assistances.

Ultimately, I proudly thank all readers of this thesis. I must apologize if any mistake has been discovered in any content.

Pakvalit Kurkoon

Table of Contents

Table of Contents (Continued)

List of Table

Page

List of Table (Continued)

Page

List of Table (Continued)

Page

List of Figure

Page

List of Figure (Continued)

Page

List of Figure (Continued)

Page

List of Equation

Page

CHAPTER 1
INTRODUCTION

1.1 Introduction

Business, technology and the environment are essential and inextricably intertwined in today's world. So much so, that the vast majority of people today would find it difficult, if not impossible, to attain happiness or even survive.

The environment has been affected by climate change to such a degree that it has had an effect on the way we live, and our quality of life. With the ever increasing production of technology products, the scarcity of raw materials and the contamination of the earth are increasing commensurately. Moreover, life is becoming increasingly challenging both physically and psychologically, due to temperature fluctuation, pollution, rising sea level and the dramatic escalation in the number of natural disasters.

Most countries in the world are turning their attention to global warming prevention policies to some degree. The result is governments in many countries are adopting laws and plans to control many business sectors in regard to air pollution, such as greenhouse gases. One example, the Department of Mineral Resources of Thailand offered a seminar on the 3R strategy (which stands for Reduce, Reuse and Recycle) to anyone who was interested. Furthermore, Thai NSTDA (National Science and Technology Development Agency) and V-Green by Kasetsart University cooperated in conducting a seminar on the topic of the motivation of Thai entrepreneurs for sustainable and environmentally aware business strategies (on 24 April 2013, Amari Hotel, Bangkok).

1.2 Statement of the Problem

Today environmentalists and researchers from both international profit and non-profit organizations are aware of the connection between IT consumption (usage, purchase and discard) and negative impact on the environment. This study presents and compares five statistical charts, which graphically depicts the global increase of carbon dioxide, temperature, sea level, information technology usage and e-waste with a summary that draws the connection between the five charts.

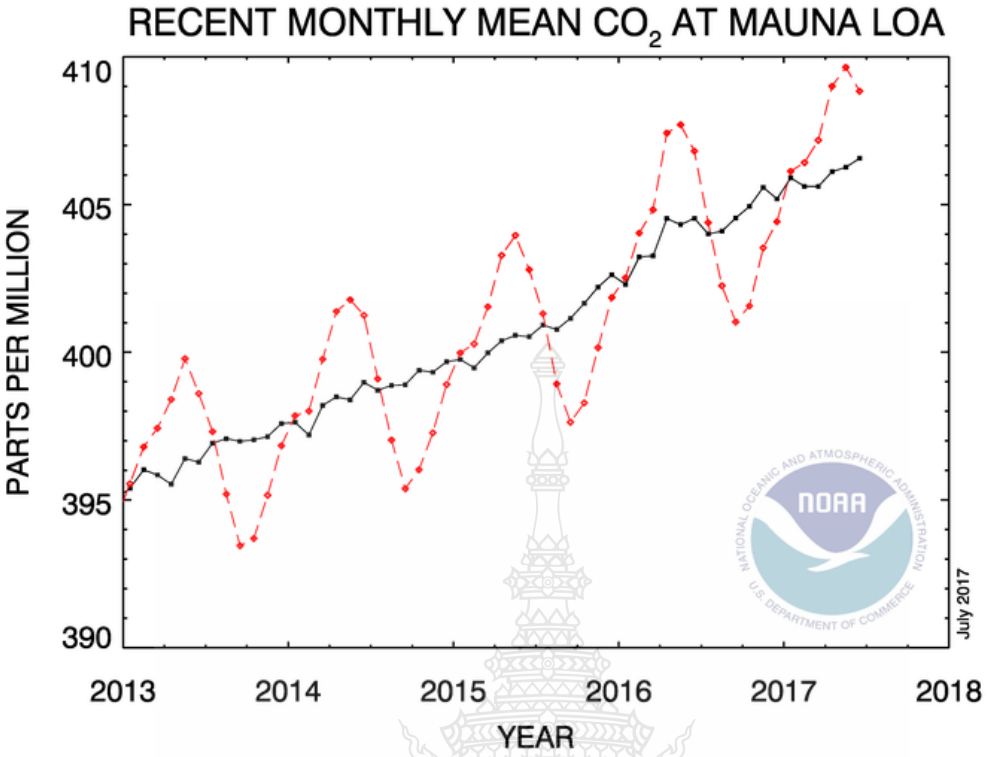


Figure 1.1 Mean carbon dioxide globally averaged over marine surface sites (last updated: July 2017) (Dlugokencky and Tans, 2017)

A comparison of the years 2015 and 2016 shows that CO_2 (carbon dioxide) emissions leaped from 399.29 ppm (parts per million) to 402.59 ppm. Air pollution is increasing every year as displayed in the figure 1.1. CO_2 and other GHGs (greenhouse gases) are dangerous because they trap additional heat in the atmosphere (WHO, 2015). The recent increase in heat caused by the trapped gases contributes directly to deaths from cardiovascular and respiratory disease, especially among elderly people (WHO, 2015; Robine et al., 2008). The next graph shows the rapid increase of global temperature.

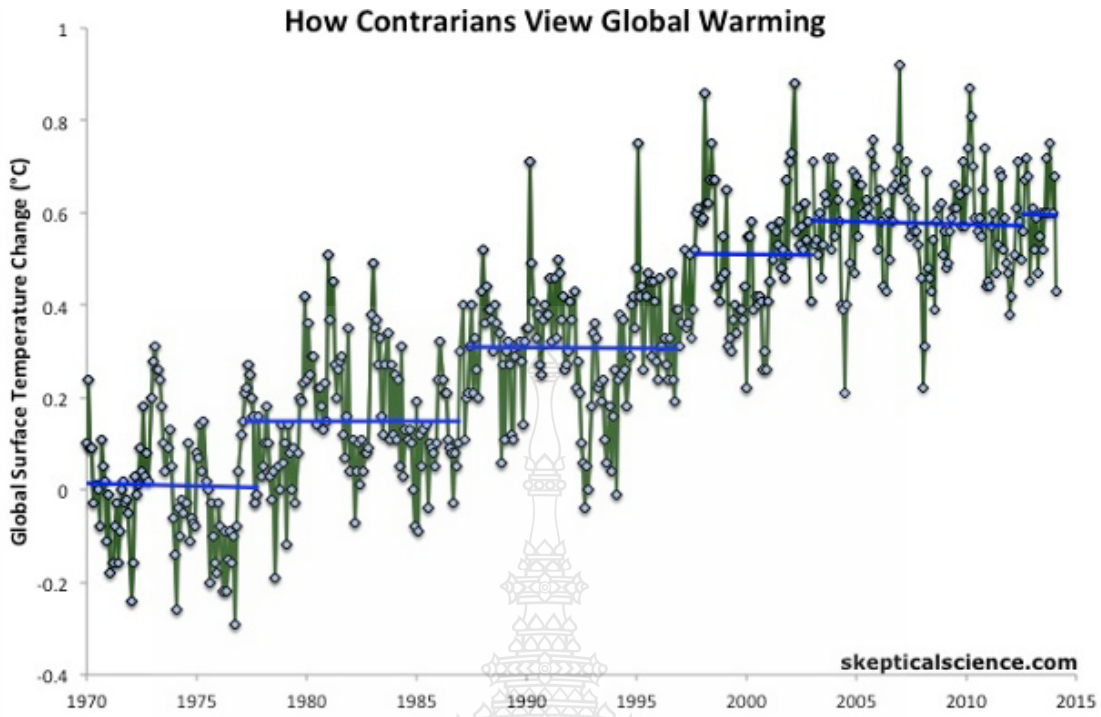


Figure 1.2 Climate change observed from 1970 – 2015 A.D. (Skeptics Science, 2015)

The figure 1.2 illustrates how average global temperatures fluctuate each year. The main problem that humanity is dealing with is that the overall global temperature has a tendency to rise in an escalator shape (blue line). As a result, not only deaths, but drought and flooding also occur more frequently and more severely. This has negative panoramic effect on many agricultural nations; Thailand, for example.

Satellite images since 1993 prove that the sea level is rising (AVISO^{+}, 2015). According to the figure 1.3, the approximate rate of increase of sea level was 3.36 millimeters per year. The inevitable result is an increase in flooding. When water inundates a country, many businesses have to pause or stop many of their operations, ultimately resulting in absolute damage to that country's economy.

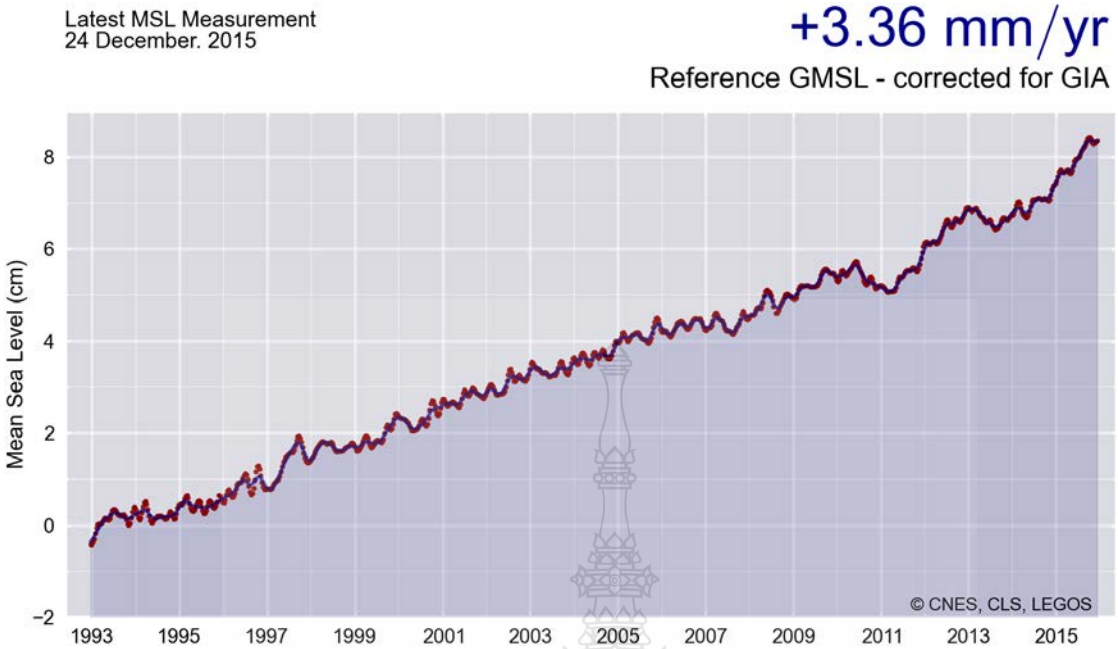


Figure 1.3 Mean sea level rise observed from 1993 – 2015 A.D. (AVISO^{+}, 2015)

Ziegler et al. (2012) have collected information from many sources that relate to the flooding in Thailand. The flood of the Chao Phraya River that occurred in September of 2011 was the worst that Thailand has seen since 1942. Flood waters overwhelmed much of Bangkok for more than 3 months (The World Bank, 2010, pp. 33; The Bangkok Post, 2011). Unusually high rainfall and water management mistakes led to destruction and damage estimated at US$45 billion (or more than THB 1,394 billion), and more than 500 dead. The flood negatively affected the lives of millions of people and the operations of countless businesses (The World Bank, December 13th, 2011). To some, the flood was hard evidence of a changing climate, which will ultimately produce dramatic increases in rainfall, stream flow, and sea level – changes that will certainly bring more flooding (START, 2011; Ziegler et al., 2012).

Unfortunately, the World Bank (Jha et al., 2011) has predicted that within the next 17 years (2030), Bangkok could disappear from the world map entirely (pp. 97, 136). Not only World Bank, but Wilent (2013) also wrote in concurrence in National Geographic magazine. The sea level is continuously rising due to the effect of the global warming. In the best case scenario, an additional 0.6 feet to the sea level by the year

2100, in the worst case, 6.6 feet. Other capital cities will be adversely affected, as well. The next graph depicts the increase of global IT usage.

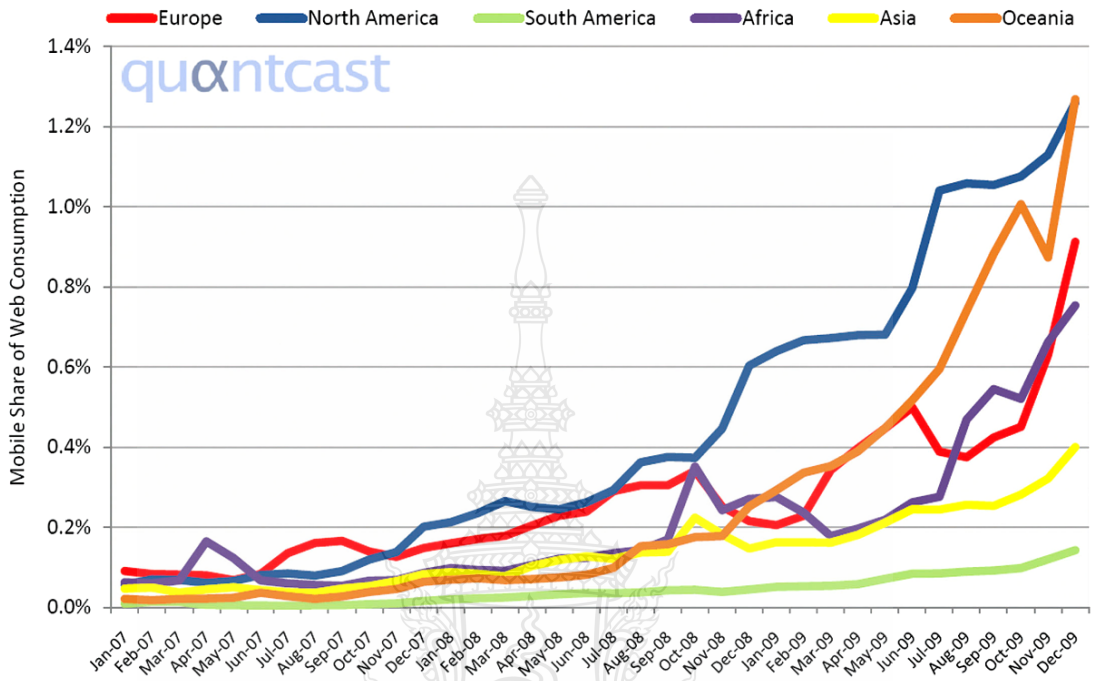


Figure 1.4 Mobile share of Pageview by Continent (2007-2009) (Quantcast, 2010, p. 6)

The threshold of smartphone and tablet growth is increasing exponentially (figure 1.4). As a result, the amount of electronic waste and greenhouse gasses are increasing drastically. Lewis (2013) (from Live Science.com) reported that 49 million tons was the estimated weight of electronic products manufactured in 2012 and 65 million tons is the estimated scale of those in 2017, which is heavier than the Great Pyramid of Giza by about 11 times. When IT products are obsolete, most became e-waste. Baldé et al. (2015) reported global quantity of e-waste generated from 2010 to 2014 and forecast the global quantity of e-waste generated from 2015 to 2018 (p. 24), as shown in the figure 1.5.

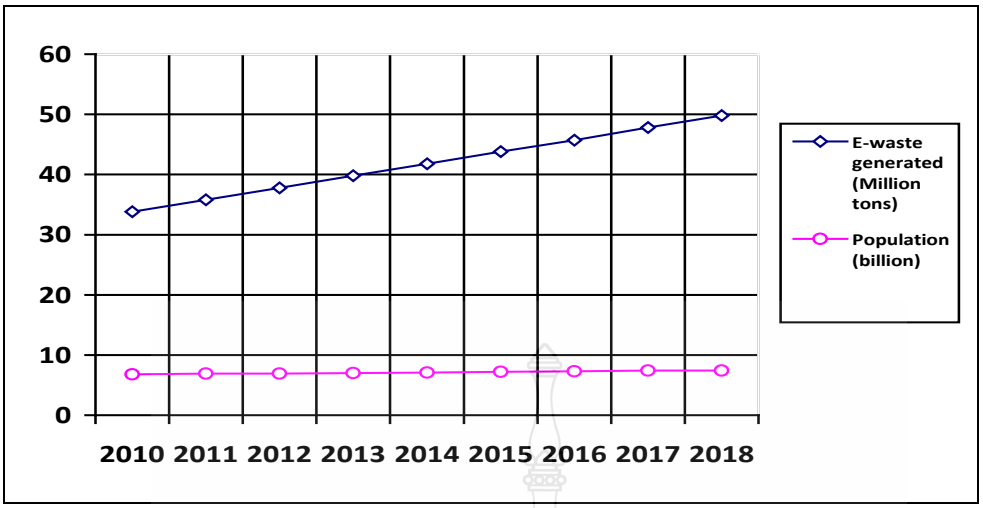


Figure 1.5 Global quantity of e-waste generated (Baldé et al., 2015)

Baldé et al. (2015) also reported on the methods people used to dispose of e-waste and the impact of those methods. Their findings were as follows: incineration of e-waste leads to greenhouse gas and mercury emissions. Dioxins can be released when PVC parts are incinerated at a low temperature (p. 31), the e-waste that is end-treated in a landfill leads to leaching of toxic metals and chemicals into the soil (p. 31) and water bodies (p. 35).

Although the global recycling rate is increasing slowly, it is still less than 50 percent of all e-waste around the world. Accordingly, incineration, landfill and dumping in bodies of water are common methods for many people, though they know that the result is polluted air, soil and water. Thus, the easier way to reduce the increasing of e-waste is to start changing consumption/adoption behavior, particularly in IT products, by increasing consumer environmental awareness.

Most consumers purchase and use technology products with little or no environmental concern. They have no idea which products are less harmful for the earth (Pickett-Baker and Ozaki, 2008; Juwaheer et al., 2012). However, some consumers voluntarily put in the attempt and resources to insist on green products.

The figure 1.1, 1.2, 1.3, 1.4 and 1.5 have one thing in common that is an increasing rate. Environmentalists and researchers believe that the volume of IT consumption (purchase, use and discard) coincides with e-waste quantity and its

negative implications toward the environment and health. However, do businesspeople and general consumers consider this connection?

In the figure 1.6, the observation by Wipro ltd. (2012) in *Growth Strategies for 2012 and Beyond* shows us what business priorities are in the minds of business executives in 308 companies all over the world. Most high ranking managers emphasized that the top three serious business priorities were to improve profitability, expansion and efficiency. As we can see in the figure 1.6, *Driving environmentally conscious growth* is almost out of their scope of interest.

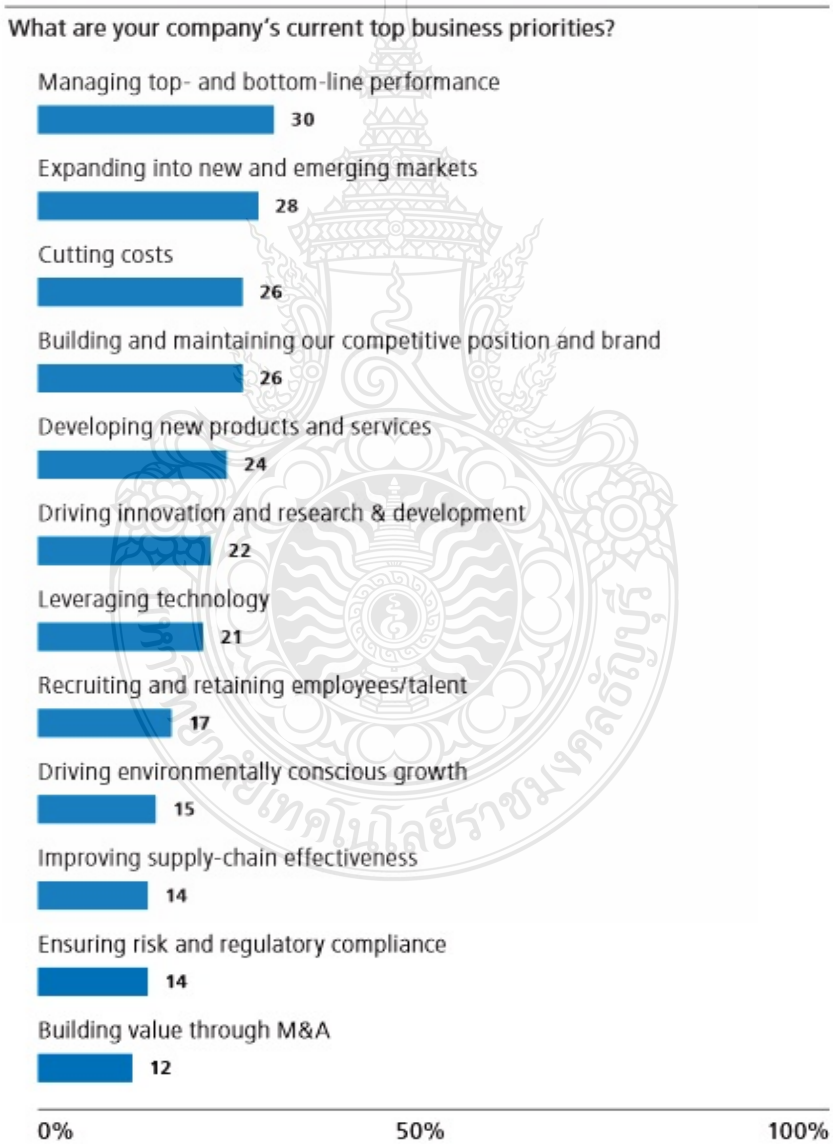


Figure 1.6 What are your company's current top business priorities? (Wipro ltd., 2012)

Figure 1.7 Company leaders and all others increasingly see sustainability as a top CEO priority (percentage of respondents) (McKinsey & Company, 2014)

As time went by, sustainable development became the goal that many businesspeople tried to achieve to establish company reputation, viability in marketplace and sustainability. Unfortunately, many businesspeople still have the misguided notion that eco-strategy is nonsense or a threat to their profitability as it leads to increased pressure on companies to conform to environmental regulations (Gavronski et al., 2011; Chen and Sheu, 2009).

Social norm is coming to be a stronger influence as well, with the growth in popularity of online social networks. Social norm is defined as one of the forces for an individual to perform behavior, such as in adopting a technology product (Venkatesh and Bala, 2008; Thompson et al., 1991; Moore and Benbasat, 1991; Taylor and Todd, 1995b; Rogers, 2003). According to Taylor and Todd (1995b), society can be separated into two levels, peer and superior. For superior, environmental policies (e.g., paperless office and energy saving) of an organization should have impact on its personnel's attitudes as well as influence peer awareness of environmental issues. The relationship between such policies and personnel attitudes still needs statistical evidence, which will explain the mechanism of how consumer environmental awareness in IT consumption

can push businesses to go green. Thus, there are two types of consumers in this study. First are consumers who work in an organization that has environmental strategies/policies in place and second those who have no relationship with an organization that has environmental concern.

Consequently, this research is a cross-sectional empirical study of consumer environmental awareness in IT adoption (purchase and use) and the mechanism that drives an individual to support green-imaged businesses. In addition, this study scrutinizes how strong the influence from environmental strategies/policies of the firm on its employees is, and what the difference between consumers who work with green companies and consumers who do not, is.

1.3 Purpose of the Study

There are three foci of this study, as follows:

1) To investigate perspectives and environmental awareness of consumers regarding their IT product purchasing behavior, knowledge of green IT products adoption/consumption, and environmental awareness within the social sphere.

2) To identify the factors that act as catalysts in the increased awareness of green purchase and use of IT products and intention to support businesses that have green image resulting from consumer sentiment.

3) The final result of this research is the study model which has the ability to predict the promulgation of sustainable development via relationship between environmental awareness of individuals in IT involved behaviors and willingness to support businesses that have a green image.

1.4 Research Questions

This researcher has distilled the scope of the study into five major questions.

Q1: What are the factors that increase environmental awareness in IT consumption?

Q2: Does environmental social awareness impact IT consumption? And how great is environmental awareness in the Thai social sphere?

Q3: Does environmental concern and knowledge of individuals increase environmental awareness in IT consumption?

Q4: Does individual intention to use/purchase green IT product drive individual support for businesses that are environmentally friendly?

Q5: How strong is the influence of environmental policies of Thai organizations on employee attitudes?

1.5 Hypothesis

Theoretically, a product which has environmentally friendly characteristics and acceptable functions will induce motivation to purchase it, especially for technology products. Consumers who are environmentally aware are likely to adopt eco-friendly IT product after examining product specifications. Social stakeholders and opinion leaders have some bearing on consumer decisions to select IT gadgets as well. If a company changes its organizational culture by adopting environmentally friendly policies, such policies may have an impact on its workforce, to some degree. When environmental friendliness is significant in a society, organizations that have green reputation will advantage in the marketplace.

To determine the validity of the previous paragraph, this study has five hypotheses to deal with:

H1: Consumption Awareness (*Perceived Green Benefit*, *Resource Sacrifice* and *Noticeability*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Age*, *Gender* and *Educational Experience* as moderating factors.

H2: Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender*, *Age* and *Experience* as moderating factors.

H3: *Environmental Concern and Habit* has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender* and *Age* as moderating factors.

H4: *Green Intention in Purchasing or Using IT Product* has an influence on *Intention to Supporting Green Imaged Business*.

H5: *Perceived Green Organizational Policy* has an influence on *Green Intention in Purchasing or Using IT Product* and *Intention to Supporting Green Imaged Business*.

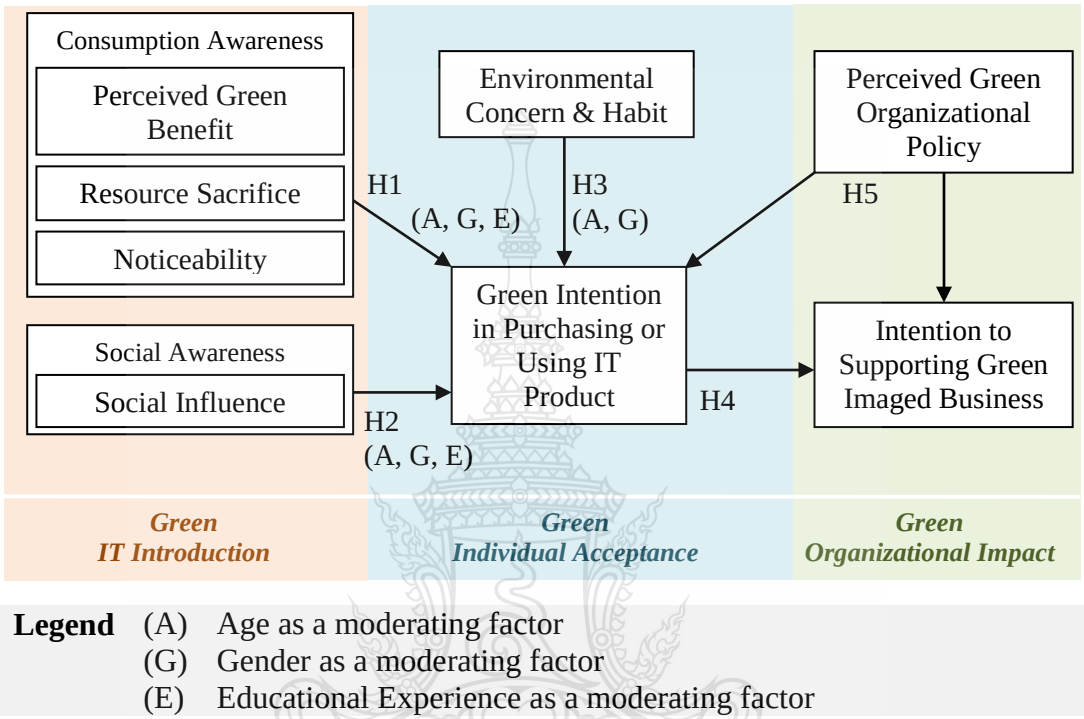


Figure 1.8 Research Frameworks

This study employs multiple group analysis and qualitative method after hypotheses proving for enlarge quantitative result. Moreover, if any hypothesis is rejected, the two additional approaches will provide detail of the rejection.

1.6 Definition of Terms

It is essential to clarify the definition of terms in this research because this study is the combination of three study topics (which are Information Systems, Consumer Behaviors, and Environmental Issue). This section will help readers to improve their understanding of some specific words which are used in this study.

Environmental Awareness: The degree of belief to which careless behaviors and their negative impact on the eco-system and the degree to which an individual plans to look for environmental friendliness of an IT product before purchase and/or use.

E-waste: This word stands for Electronic waste, which is defined as a disused or obsolete technology product.

Eco-label / Green Label / Green Sticker: is a form of sustainability measurement directed at consumers, intended to make it easy to take environmental concerns into account when shopping.

Environmental-friendly / Eco-friendly / Green: are general terms used to refer to services and goods, rules, laws, guidelines and policies claimed to result in a reduced, minimized, or neutral effect on ecosystems or the environment.

Global Warming: is the gradual rise in the earth's temperature which is believed to be caused by the increase of certain gases, such as carbon dioxide (CO_2), in the atmosphere.

GHG: Greenhouse Gas, which is any of the gases whose absorption of solar radiation is responsible for the greenhouse effect, including methane (CH_4), ozone (O_3), carbon dioxide (CO_2), and the fluorocarbons (Perfluorocarbons, PFCs).

Sustainable Development: is defined as any structure or commercial activity that can be maintained over time without damaging the environment; development balancing present day endeavors with the protection of the interests of future generations.

Sustainability Report: is an organizational report that gives information about economic, environmental, social and governance performance.

Competitive Advantage: is the ability gained through attributes and resources to perform at a higher level than others in the same industry or market. In other words, it is the power that helps an organization outperforms its rivals.

Smartphone: is a cellular phone or mobile phone that is capable of Internet connectivity, a variety of mobile computing capabilities, etc.

Tablet / Tablet PC: is a small, thin, portable computer having an LCD/LED/OLED/E-ink screen onto which data can be input with a stylus or the fingertips.

Technology Product: in this study, Technology Product is defined as all kinds of IT products, such as desktop computer, notebook, tablet, smartphone, mp3 player, etc. It includes accessories as well (e.g., earphone speaker, keyboard, mouse, CD-ROM and so forth).

1.7 Gap and Potential Research Contribution

There are very few studies that have examined consumer behavior, IT adoption, environmental implications and environmental corporate image and how they interact. This study takes a significant step toward filling this gap between studies of IT acceptance, studies of business and studies of the environment.

This research study scrutinized the areas of environment, consumer behavior, information technology adoption, corporate environmental image perception and interaction. This study chose to provide a better insight into:

1) Understanding environmental awareness level of IT product adoption or (purchase/use) of Thai consumers and environmental awareness degree of Thai society from regression weights of the hypothesis 1, 2, 3 and descriptive statistic results.

2) Understanding customers' attitudes about the environmental situation, their environmental behaviors and their willingness to concern themselves with eco labels in their purchasing behavior. A result of descriptive statistics, such as a mean, can be used to determine the current mindset of consumers regarding environmental issues and their green readiness.

3) Explaining that environmental policies or strategies in the organizational culture may or may not improve environmental friendliness of employee IT product adoption. Moreover, explain correlation between intention to adopt eco-friendly IT product and willingness to support businesses with eco-friendly reputations as opposed to companies without such reputation by consumers. The hypothesis 4 and 5 will tell us whether the possibility for the current contribution can come to fruition or not.

4) The result of this study is a framework for predicting green IT acceptance by consumers and their intention to support green businesses, as this study title implies. The framework should open the door to new knowledge to fill many research gaps. The contribution to the MIS and other social science study fields of the current study

framework is at least a guideline for researchers that they could adapt for a specific study subject, integrate with other theories for better prediction, argue/comment to update the framework, and so forth.

1.8 Scope of the Study

Samples in this study are consumers in Thailand. The study sample will be divided into two different categories, which are (1) consumers who are personnel of businesses that have environmental policies/strategies, and (2) consumer who have no involvement in businesses that have environmental policies/strategies. Separate consumers by average statistical value of environmental policies/strategies perception level of the respondents.

1.9 Organization of the Study

In this study, there are five chapters. The first one is the introduction, problem statement, purpose of the study, research questions, hypothesis, study framework, definition of terms, gap, potential research contribution and scope of the study.

Chapter two begins with resource criteria and establishes the literature reviews of many previous studies that relate to this study which are IT/IS, Green IT/IS, advantage of environmental-friendly and green strategy, green indicator, consumption and acceptance theories, and constructs.

In chapter three, the research methodology of quantitative research for analyzing data, hypotheses testing, validation testing, and results are available.

Chapter four shows the result of statistical analysis. This dissertation includes a discussion before the conclusion and suggestion of future research in the final chapter.

CHAPTER 2
LITERARY REVIEW

Structure of this chapter

This section composed of eight topics, as follows:

2.1 Literature Review and Criteria

2.2 Information Technology and Information System

2.3 Green IT

2.4 Advantage of Environmental-friendly and Green Strategy

2.5 Green Indicator

2.6 Theoretical Background

2.7 Model Development

2.8 Constructs in this study

2.9 Chapter Conclusion

2.1 Literature Review and Criteria

In this section, this study describes literature review and background theories from academic journals, books, reports and other material to make readers better understand the purpose of this study and what it is trying to ascertain. There are some special meanings, specific definitions and abbreviations for this research.

This research selected literature using the following criteria:

1) Literature (article, book, magazine, report, newspaper, figure, etc.) related to environmental, information technology and information system adoption or acceptance, business strategy and management, and customer need and satisfaction,

2) The research methodology or information is clearly described,

3) Focus on academic journals (such as MIS Quarterly for studies of technology, and Journal of Environmental Management for environmental articles) rather than other sources (as suggested by Neuman, 2011, pp. 127).

To avoid confusion, it is necessary to differentiate the definitions of the term ‘Environment’ and to specify the lexical meaning that this researcher is expounding on. The first definition relates to work atmosphere (Pearlson and Saunders, 2006, pp. 203).

The second refers to the natural world, the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time. For this study, 'Environment' is the second definition.

2.2 Information Technology and Information System

Today, there are a lot of definitions for the word 'Information Technology' (IT) and 'Information System' (IS). Turban and Volonino (2012) gave their opinion that IT refers to the technological side of an IS (pp. 8). It is a narrow definition of IT. Often the term IT is used correspondently with IS. Therefore, the terms IT and IS are considered to be the same thing. Information System (IS) sounds like a big system that has many elements rather than a single process, method or hardware. Basic functions of an IS are input (e.g., keyboard, microphone, touch screen, CD-ROM), processing/storage (e.g., Calculate by CPU, storage in RAM) and output (e.g., display, document, sound), and include a user. In the same stream, Jessup and Valacich (2008) explained IS as various combinations of hardware, software, and telecommunication networks that humans build and are employed to collect, and distribute useful data. Thus, IS is a combination of five elements: people, hardware, software, data, and telecommunication (pp. 10). On the other hand, IT refers to machine technology that is controlled by or uses information. Moreover, an IS/IT can be a small gadget such as a smartphone or a tablet with software that is able to load a Web site (Turban and Volonino, 2012, pp. 9). Accordingly, this researcher decided to define IT and IS as computer notebooks, computer monitors, and includes small gadgets like smartphones, tablet PCs and so forth.

2.3 Green/Eco-friendly IT

In this study, green is not just a color but conveys the sense of something that is environment-friendly. Baumann et al. (2002) used Green to describe firms, products, and production processes that use less energy, that recycle materials, that reduce waste and pollution, and that conserve natural resources. In Murugesan's (2008) article, Green IT can be defined as environmental awareness in the practice of designing,

manufacturing, using, and disposing of electronic devices like computers, servers, and associated subsystems, such as monitors, printers, storage devices, and networking and communications systems, efficiently and effectively with minimal or no impact on the environment. This definition is accepted by IS researchers (e.g., Vykoukal et al., 2009). One of the Murugesan's (2008) Different dimensions of Green IT that is suitable for this kind of study is Green use of IT (Purchasing and use of green IT products).

The Green use of IT focuses on minimizing energy cost and reducing greenhouse gas emissions by maximizing the efficiency and decreasing the energy consumption of IT resources (Vykoukal et al., 2009). The growth of IT product use is increasing exponentially. At present, over 4 billion people use mobile phones. Turban and Volonino (2012) predicted that the number of mobile phone users is expected to reach 8 billion in the 2020s. Moreover, the increase of electronic waste is an impending crisis that mankind must act on now. In the year 2012, we had about 49 million tons of e-waste, and we will have approximately 65 million tons of e-waste by 2017. How do people deal with e-waste globally? Some burn it or toss it into landfills, resulting in air, soil, and water pollution. This jeopardizes every living thing on this planet.

The green indicator on a product surface or packaging should proclaim that users, technicians, and manufacturer can repair, upgrade, recycle, and dispose of it whenever an owner wants to (Velte et al., 2008).

With many studies and conferences, we have to accept that IT and human activity are both contributors to the global warming problem and IS researchers are trying to urge people to be conscious of the need to go green (Pernici et al., 2012). So, we can view IT both as a part of the problem and part of the solution (Fuchs, 2008; Dedrick, 2010).

2.4 Advantage of Environmental-friendly and Green Strategy for the Firm

In the past, according to Hart and Ahuja (1996), the green movement provided advantage to some degree. In their study example, 3M Company launched a new way to manage pollution in 1975. Fifteen years later (1990), total emissions had been reduced by 50% (about 530,000 tons) and further resulted in $500 million cost savings (lower raw material use, green compliance and lower disposal cost). Early environmental

management researchers (Rooney, 1993; Hart, 1994) said, citing empirical evidence, that in the beginning phases of pollution prevention there is an opportunity to pick a 'low-hanging fruit', meaning that effortless and inexpensive behavioral and material changes can result in large emission reductions relative to costs and involve other sources of sustainable competitive advantage (Ghemawat, 1986), such as first mover in an emerging green product market. First-mover advantage, Hitt et al. (2001) explained that it is an early competitive advantage that allows firms to anticipate customer needs and shape their industry's future (pp. 152). To elaborate on sustainability, the definition of sustainability is development that meets the needs of the present world without compromising the ability of future generations to meet their own needs (Molla et al., 2011).

A few years later, some researchers advised that green management is similar to an armament of the firm by helping businesses to improve their competitiveness (Hart, 1995; Porter and van der Linde, 1995; Hart, 2005; Trung and Kumar, 2005; Ambec and Lanoie, 2008; Chang and Fong, 2010). A perceived responsibility to the environment puts an organization in a better light and improves its brand image. In the study of Chang and Fong (2010), they pointed to previous studies (Abdullah et al., 2000; Zins, 2001; Park et al., 2004; Chang and Tu, 2005; Martenson, 2007) to prove that corporate image had a significant impact on Customer Satisfaction and Customer Loyalty. Likewise, Hennig-Thurau and Klee (1997) talked about Customer Retention, which is to keeping consumers from changing their minds. Hence, Customer Retention and Customer Loyalty are intertwined with Customer Retention as an internal business operation involves keeping consumers loyal, and Customer Loyalty is an attitude developed by consumers which allows a company to keep them. Furthermore, green products as a differentiation strategy leads to the enhancement of competitive advantage that can not only satisfy the environmental needs of consumer, but also raise customer satisfaction, loyalty, and attitude toward brand image (Abdullah et al., 2000; Chang and Fong, 2010).

Many researchers, not only environmentalists, but also IS, management and others have said that green strategies are indispensable. Therefore, green strategies are acceptable in two different schools of thought – Porter (1985) and RBV (Barney, 1991).

Michael E. Porter (1985, pp. 11) argued that there are but two basic types of competitive advantage a firm can possess, low cost and differentiation (cited by Mintzberg et al., 1998, pp. 102). Porter explained this in detail in Generic Strategies, tactics that are still implemented by modern businesses to this day. Differentiation, this strategy involves the development of unique products or services, relying on brand/customer loyalty. In addition, a company able to offer higher quality, better performance, or unique features, any of which allows it to justify higher prices. According to a survey conducted by the Aberdeen group (2008), most respondents in the research said that green products offer greater competitive product differentiation. This survey result concurs with the studies of Abdullah et al. (2000), Chang and Fong (2010). Plus, green strategies offer the ability to lower costs by reducing unnecessary expenses, as shown in the 3M case study of Hart and Ahuja (1996). Differentiation, cost leadership, or both at the same time absolutely benefit a firm. In RBV theory as this researcher described before, in order to go green, a firm needs to learn more about how to become a friend with environment. Knowledge attained from experience can count as an intangible asset of the firm (Hart, 1995; Shi et al., 2012) and can be used in the conception and implementation of their strategies (Barney and Arikan, 2006).

Taking the above a step further, top electronics manufacturers, such as Apple, Samsung and so on, are implementing device recycling programs that let customers trade in their old devices for discounts on new ones. With this strategy, companies can reduce material costs and consumers can reduce their purchase price too.

In summary, for businesses in this day, environmental sustainability is a significant part of the movement toward Corporate Social Responsibility (CSR). There are three eco-dimensions of CSR:

1) Purchasing based on firms' corporate social responsibility (CSR) performance,
2) Recycling, and
3) Avoidance and use reduction of products based on their environmental impact (Webb et al., 2008).

However, all stakeholders should be more concerned about the environment because the threat of global warming is closely linked to many issues (e.g., rising energy costs, GHGs emissions are highly correlated with energy use) (Dedrick, 2010).

As we can see, there are vast amounts of research on the relationship between the environment and business, but only a few studies in regard to the relationship between the environment, the consumer, and IT. This is a critical gap in research and should be filled to better understand how and why to compel the consumer to be more concerned about the environment and pollution.

2.5 Green Indicator

How can a customer know which products are environmental-friendly? There are symbols on the products that indicate the level of green. Globally it's called an 'Eco-label' (or 'Green Sticker'), which is labeling systems for food and consumer products. Most countries have their own eco-label (figure 2.1). These are symbols of environmental sustainability and protection directed at consumers encouraging them to do their part in preserving the environment when it comes to making purchases.

Figure 2.1 Ecolabels (PTIT, 2010)

It is not easy for businesses to get this eco-label printed on their products. So, green strategies that bring an eco-label to the firm ultimately result in a competitive advantage due to the prestige and appeal it offers to consumers (in RBV).

Take the Green Label of Thailand as an example, in this symbol, ‘the face with a smile' represents humanity, ‘bird’ for fauna, and ‘tree’ for flora and mother earth. The Thailand Environment Institute (TEI) (2010) has drawn up the following objectives for this project:

1) To reduce overall pollution within the country,

2) Provide information about environmental impact of products, and

3) To encourage businesses to go green for long-term sustainability.

There are 3 regulation sets for business to obtain the right to use the green label, which are:

1) Environmental impact – These product requirements are established and categorized into a differentiation of environmental impact results (e.g., hazardous material, air pollution, tainted water, ground adulteration, and waste), and benefit to environment.

Drawing these requirements by use base on Life Cycle Assessment (LCA) is difficult in this day. Therefore, TEI decided to employ Life Cycle Considerations (LCC) but with a high focus on environmental impact in consumption, disposal, reusability, and recyclability rather than other phases.

2) Company adherence – Because the Green Label project’s focal point is the minimization of environmental impact, in order for a product to display the eco label all governmental requirements must be met. This policy motivates healthy competition for companies to improve their production technology and other business processes to make their efforts friendlier to the environment.

3) Measurable – To formulate the rules, the TEI considers measurability in product and process. The measurability concerns environmental impact and product quality. Companies that apply for the Green Label must facilitate measurability by making the evaluation process simple, thereby making measurability expeditious and inexpensive.

This research suggests that most IS researchers are not familiar with 'LCA' and 'LCC'. So, what are LCA and LCC? The LCA (ISO 14040:2006 and ISO 14044:2006) investigates environmental impacts of e.g. systems or products from cradle to grave throughout the full life cycle, from the exploration and supply of materials and fuels, to the production and operation of the investigated objects, to their disposal/recycling (Joshi, 2000; Pehnt, 2006; TGO and MTEC, 2012). The LCC relates to principles of life cycle analysis and value, for money is a key to the *Policy on Green Procurement*. The LCC explains the life cycle approach and explores how environmental considerations can be integrated in each of the procurement phases – planning, acquisition, use and maintenance, and disposal. Truly, LCC is not completely a model or theory but it is a simple explanation of the life-cycle of a product. Thus, it differentiates from the LCA.

As for carbon footprint, it relates to the amount of Greenhouse Gases (GHGs) (e.g., CO_2) emitted by a business activity (such as a transportation and production). Roughly 72 percent of GHGs are produced CO_2. Carbon footprint is generally measured in $MtCO_2e$ (Metric ton Carbon dioxide equivalent) and $GtCO_2e/y$ (Gigaton Carbon dioxide equivalent per year) (TGO, 2011; TGO and MTEC, 2012; Turban and Volonino, 2012). In Dedrick's (2010) study, carbon productivity for the world economy in 2008 was estimated at $740 of GDP per ton of CO_2 equivalent emission (CO_2e). To sustain historical rates of economic growth while reducing CO_2e emissions below 500 parts per million (a target identified by The Intergovernmental Panel on Climate Change (IPCC) as limiting temperature increases to 2.5 degrees Celsius), carbon productivity must increase nearly tenfold by 2050 (Beinhocker et al., 2008). Global Warming Potential (GWP) is the measurement unit of an ability to increase temperature by IPCC. Methane, for example, its GWP_{100} equals 25 reflecting that 1 kilogram of Methane is equivalent to CO_2 25 kilograms (TGO and MTEC, 2011). The carbon footprint label (ISO 14025) came into use in Thailand in 2011 (Shewarunotai, 2011).

However, there are some other eco-labels, like the Recycled Logo, the Energy Star, the CE (Conformité Européenne) mark and the TCO certified, which can be understood by consumers at a glance. For example, the Energy Star (figure 2.2), the Electronic Product Environmental Assessment Tool (EPEAT) is a searchable database

of computer hardware that meets a strict set of environmental criteria and is maintained by the Green Electronics Council (GEC). Among other criteria, products registered with EPEAT and comply with the U.S. government's Energy Star 5.0 rating; have minimized the volume of cadmium, lead, and mercury in a product; and are easier to upgrade and recycle. Moreover, products with Energy Star logo must be energy efficient (Turban and Volonino, 2012).

Figure 2.2 Energy Star (Turban and Volonino, 2012)

In the Natural Marketing Institute (2008) study Green Labels Positively Impact Purchase Behavior it was determined that eco-labels attract consumers when they are making a purchase. About 66 percent of the population in the study was more likely to purchase hardware that had an Energy Star sticker on it. The Recycled logo had an impact on 54 percent, USDA Certified Organic influenced 29 percent, and the Fair Trade Certified sticker had an impact on 15 percent of the study population. In this regard, the eco-label is playing a significant role in taking steps toward protection of the environment.

Another green indicator for buyers is the SD report. Most top technology companies make a Sustainability Development (SD) report every year. For example, Apple Inc. documented that their environmental footprint in five sections: Manufacturing (61 percent), Transportation (5 percent), Product use (30 percent), Recycling (2 percent), and Facilities (2 percent). The highest carbon emission phase is manufacturing, followed by product use. Manufacturing is about 61 percent of all total GHGs emission (18,934,000 metric tons). They have implemented a green strategy in this phase, reducing total emissions, such as toxic material removal (Lead-free, BFR-free, Mercury-free, Arsenic-free glass, and PVC-free). The consumption phase contributes about 30 percent or 9,306,000 metric tons of GHGs. To give an idea of the impact of consumption of a smartphone and tablet (in 2012), iPhone 5 use resulted in

1.1 g of CO_2 per hour, and iPad mini emitted 1.5 g of CO_2 per hour. That is a very small amount when compared with a 60-Watt incandescent light bulb (40.0 g of CO_2 per hour).

2.6 Theoretical Background

Technology purchase and utilization are one of major studies in Management Information System (MIS). Green implication refers to the behaviors that are most regularly cited as being examples of it. Purchasing products that have a reduced environmental impact, avoiding products that use aerosols, and purchasing recycled paper products are examples of this (Gilg et al., 2005). Likewise, Kim and Connolly (2012) wrote that "using IT responsibly and effectively to reduce energy, water and paper consumption, deploying effective technological practices, such as Energy Star compliance, which powers down computers automatically after periods of inactivity and server virtualization" are just some of the opportunities to go green. In this study, consumption is not different from utilization. Before utilization, the usability or use phase begins, there has to have been acceptance at an early stage. Fortunately, there are a lot of theories that are ventured relating to user acceptance and technology adoption in the MIS field.

2.6.1 Theory of Reasoned Action and Theory of planned behavior

Theory of Reasoned Action is the very first acceptance model in MIS field. Fishbein and Ajzen pioneered TRA to scrutinize the correlation between attitude, intention and behavior (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980). This theory can predict the intention to perform behavior based on an individual attitude and normative beliefs. Positive attitude toward behavior will exist when a person believes that particular behavior can lead to a worthy outcome. *Subjective norm* is a person's perception of what people around him/her think or say that person should do. Attitude and Subjective norm lead to individual intention behavior and, finally, makes the behavior occur (Ajzen and Fishbein, 1980).

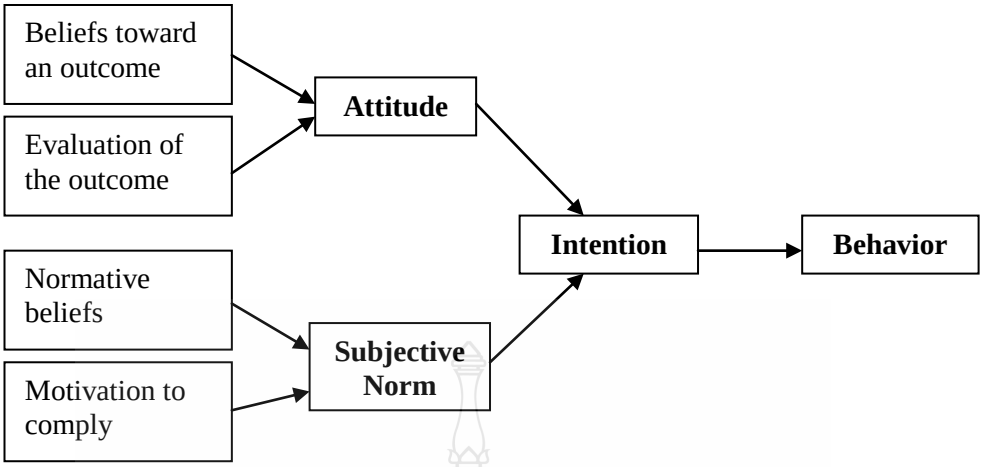


Figure 2.3 Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980)

Theory of planned behavior (TPB), a prominent TRA, overcomes the TRA's limitations in dealing with behaviors over which people have incomplete volitional control (Fishbein and Ajzen, 1975; Ajzen, 1991). A new variable, *Perceived Behavioral Control* (PBC), was added to the model. PBC is defined as the extent to which people believe in their ability to perform a behavior of interest (Ajzen, 1991). In other words, it is similar to self-efficacy (Bandura, 1977; Bandura, 1982). However, for TPB, empirical studies reported that merely 40 percent of the variance of behavior can be predicted using TRA or TPB (Ajzen, 1991).

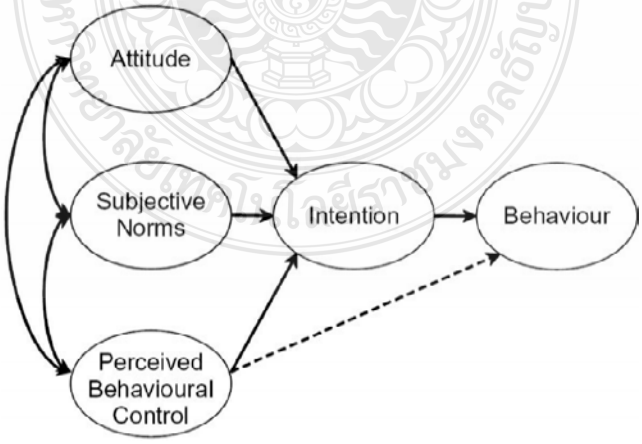


Figure 2.4 Theory of Planned Behavior (TPB) (Ajzen, 1991)

2.6.2 Technology Acceptance Models

TRA and TPB rewarded the MIS study field with the greatest knowledge. One of the benefits is Technology Acceptance Model (TAM). Davis (1989) became curious about the way people perceive usefulness, ease of use of a technology and ultimately and how people accept it. Davis (1989) explained that "the degree to which a person believes that using a particular system would enhance his/her job performance" is *Perceived Usefulness*, while *Perceived Ease of Use* is "the degree to which a person believes that using a particular system would be free of effort." These two factors are beliefs and attitudes that lead to behavioral intention to use and actual system use (Davis, 1989; Venkatesh et al., 2003).

Previous studies used TAM as a core theory and adapted it with numerous external variables (e.g., *Self-efficacy, Innovativeness* and *Social Influence*) to explore different study contexts. From many results, Venkatesh and Davis (2000) expanded the scope of TAM by adding five constructs (*Subjective Norm, Image, Job Relevance, Output Quality* and *Result Demonstrability*) and two moderators (*Experience* and *Voluntariness*).

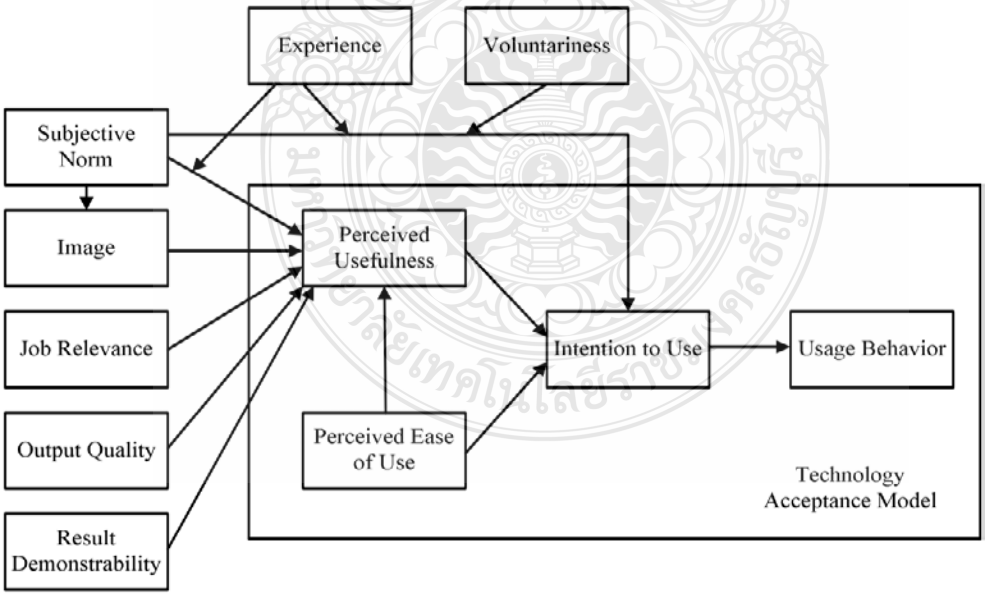


Figure 2.5 Extended Technology Acceptance Model (TAM2) (Venkatesh and Davis, 2000)

Eight years later, TAM was extended a second time. Venkatesh and Bala (2008) integrated TAM2 with the model of the determinants of perceived ease of use (Venkatesh, 2000) to render TAM3, which has "a complete nomological network of the determinants of the individuals' IT adoption and use." There are six new variables, which are *Computer Self-efficacy*, *Perceptions of External Control*, *Computer Anxiety*, *Computer Playfulness*, *Perceived Enjoyment* and *Objective Usability*, to widen the scope of previous *Perceived Ease of Use*.

2.6.3 Diffusion of Innovation

Once, Rogers' Diffusion of Innovation (DOI), also known as Innovation Diffusion Theory (IDT), is one of the popular theories used to extrapolate user behaviors. Not only does DOI have the ability to predict consumer behavior toward and acceptance of technology, but it is also well-known and highly utilized by other study disciplines (e.g., agriculture and medical) too. Rogers implied that innovation cannot diffuse by itself; human communication is the only way for diffusion to occur. In the DOI, there are five factors – *Relative Advantage*, *Compatibility*, *Complexity*, *Trialability*, and *Observability* – that relate to an individual's decision to adopt or reject an innovation. Moreover, Rogers separated the adopter into five categories (from Innovators to Laggards). Rogers (2003) pointing out that people who have a higher opinion leadership have the ability to win over others to increase the rate of adoption of innovation.

DOI has been meta-analyzed numerous times to measure various results of its factors. Recently, Weigel et al. (2014) did meta-analysis on DOI and TPB (Theory of Planned Behavior) simultaneously, they stated that *Relative Advantage*, *Compatibility*, and *Complexity* are the most systematically important associations with innovation adoption in the previous study (Tornatzky and Klein, 1982), and summarized that they have almost the same result as Tornatzky and Klein (1982). More testable studies using *Trialability* and *Observability* were available for Weigel et al. (2014) than Tornatzky and Klein (1982). Consequently, Weigel et al. (2014) found that *Trialability* and *Observability* have a positive correlation to innovation adoption.

2.6.4 Unified Theory of Acceptance and Use of Technology

In another school of thought, UTAUT (figure 2.6), Venkatesh et al. (2003) designed this acceptance and used this model to illustrate the intention of users to utilize an information system and follows their behavior. There are four keys – *Performance Expectancy*, *Effort Expectancy*, Social *Influence*, and *Facilitating Conditions* – which are direct factors to their behavior and intention of utilization. There are four keys that have an influential effect on behavior and intention of utilization – *Gender*, *Age*, *Experience*, and *Voluntariness of Use* (or *Willingness*). According to Venkatesh et al. (2003) and Munguatosha et al. (2011), the theory was a union of the eight models – Theory of Reasoned Action by Fishbein and Ajzen (1975), Technology Acceptance Model by Davis et al. (1989), Motivational Model by Davis et al. (1992), Theory of Planned Behavior by Ajzen (1991), The combination of TAM and TPB by Taylor and Todd (1995a), Model of PC utilization by Thompson et al. (1991), Innovation Diffusion Theory by Rogers (1995), and Social Cognitive Theory by Bandura (1989). UTAUT was also validated in its ability to explain 70 percent of the variance in behavioral intention in information technology in various fields, such as acceptance of E-Government (Alzahrani and Goodwin, 2012), Course management software (Marchewka et al., 2007), E-medical recorder (Wills et al. 2008), mobile device (Qingfei et al., 2008). UTAUT has been found to outperform other models, including TAM (Lee et al., 2003). In 2012, UTAUT2 by Venkatesh et al. (2012) incorporated three constructs in to UTAUT – Hedonic Motivation, Price Value, and Habit – and some new moderators. Venkatesh et al. (2012) found that UTAUT2 prediction ability in consumer behavior showed an increase to 74 percent, a four percent increase over the original UTAUT.

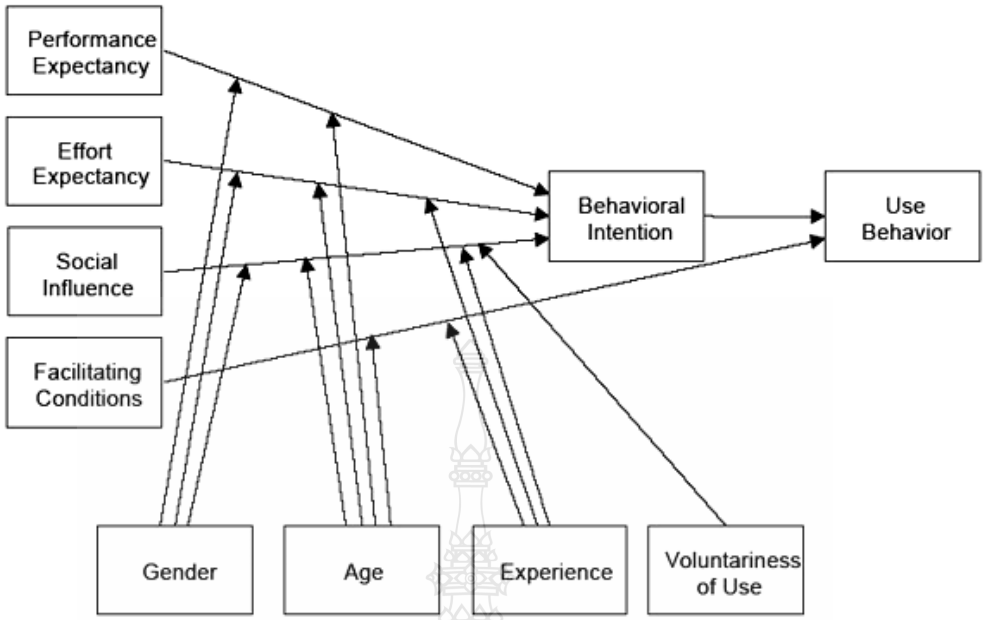


Figure 2.6 Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003)

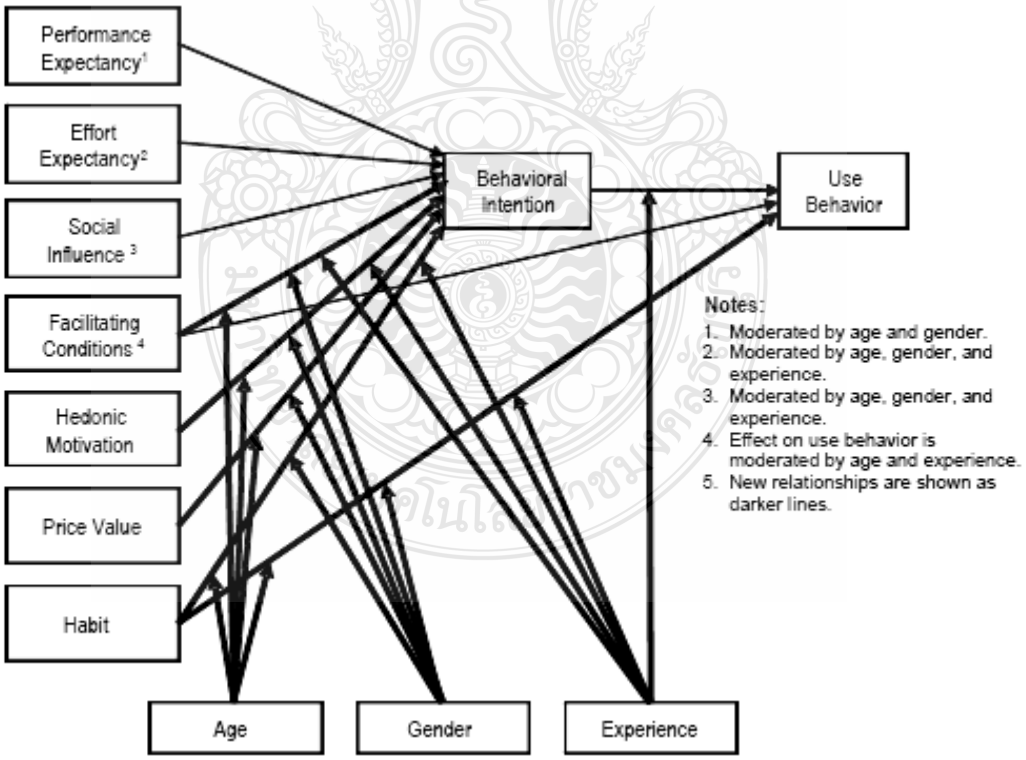


Figure 2.7 Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012)

2.6.5 Information System Success Model

In the late 1980s, social scientists theorized different aspects of the success of information system implementation thus making it difficult to develop a valid measurement tool. DeLone and McLean (1992) arranged many dimensions of IS success then rendered them into a descriptive framework. DeLone and McLean (1992) mentioned Shannon, Weaver (1949) and Mason (1978) for reasons to separate the overall communication mechanism into six major dimensions, as follow: *System Quality, Information Quality, Use, User Satisfaction, Individual Impact,* and *Organizational Impact*.

The IS Success model was changed by DeLone and McLean (2003). In order to keep the theory up to date, DeLone and McLean (2003) analyzed many previous studies which applied, validated, challenged, mentioned, and suggested the original IS Success. The outcome is a series of recommendations for present and future IS success measurement. *Service Quality* and *Intention to Use* were new dimensions in the updated IS success model while *Individual Impact* and *Organizational Impact* became one dimension, *Net Benefits*. The idea of classifying the acceptance of technology is applicable to this study.

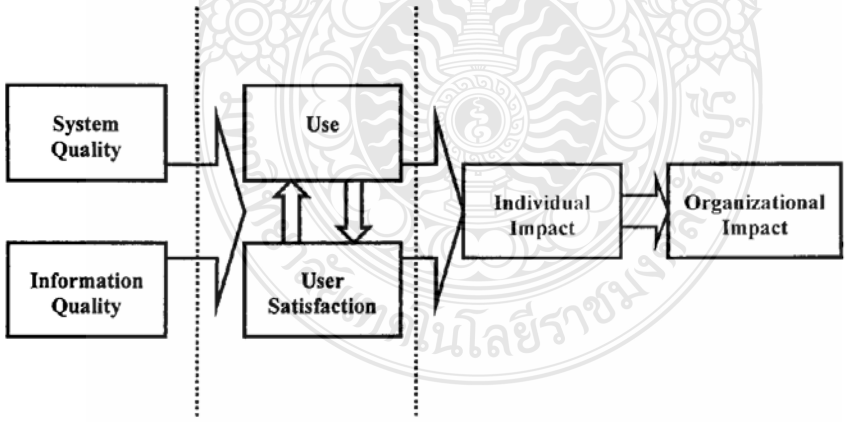


Figure 2.8 D&M IS Success Model in 1992 (DeLone and McLean, 2003)

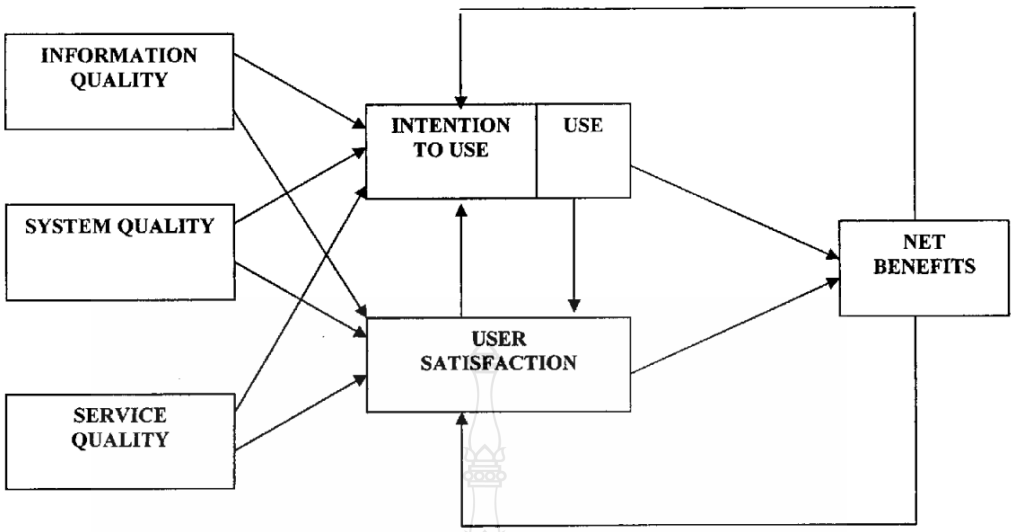


Figure 2.9 Updated D&M IS Success Model (DeLone and McLean, 2003)

2.6.6 Health Belief Model

Hochbaum, Rosenstock and Kegels are social psychologists who presented HBM in the 1950s (Rosenstock, 1974). Constructs of HBM are *Perceived Susceptibility, Perceived Severity, Perceived Benefits, Perceived Barriers, Cues to Action, and Self-Efficacy* (Glanz et al., 2008, p. 48). Most researchers and physicians used the HBM to examine behaviors of patients and their relatives in regard to diseases and their reaction to physicians. The HBM can be found profusely in modern research (e.g., Jones et al., 2013; Yazdanpanaha et al., 2015).

2.7 Model Development

It is practically impossible for many psychological processes, such as the perception of product benefits, purchasing, and impact on business, etc., to occur simultaneously. Consequently, the constructs in this study should be separated. As discussed earlier, DeLone and McLean (1992) cited Shannon and Weaver (1949) and Mason (1978) to divide stages of the IS Success model. Shannon and Weaver (1949) segregated the communication into three major levels and defined them. They called it The Mathematical Theory of Communication (Severin and Tankard, 2010, p. 49). Afterwards, Mason (1978) relabeled Effectiveness to Influence, redefined it, and

separated it into three events. DeLone and McLean (1992) restructured the last phase into four variables. About ten years later, DeLone and McLean improved their IS Success theory with two new variables, and they unified impact on individual and organization together as the important success measures because they capture the balance of positive and negative impacts of IS on the customers, suppliers, employees, organizations, markets, industries, economies, and even societies (DeLone and McLean, 2003).

2.7.1 Communication Theories and Information System

The Shannon and Weaver's hierarchy of level (1949) and Mason's (1978) categories, which was cited by DeLone and Mclean (1992; 2003), is very applicable to the current study. The concept of the three mentioned theories is used as criteria to separate the study model into the three periods of time as explained in the previous paragraph. In brief, a categorization of stage classification can be divided by difference of areas of influence, as follows:

1) A study subject's appearance, performance, support, and so on

Shannon and Weaver's (1949) *Technical Level*, *Semantic Level*, Mason's (1978) *Production of Information*, *Product*, DeLone and McLean's (1992; 2003) *Systems Quality* and *Information Quality* are related to transmitting and receiving a message. For this study and green IT context, a message means knowledge and experience that are garnered from consumer examination of the green IT product. In other words, an IT product can send messages in the form of knowledge and experience to a user when both interact. Moreover, DeLone and McLean's (2003) *Service Quality* is an added dimension with no clear comparison to their previous work from which it is derived, but is a measurement scale of support and endorsed by others. This means messages about the green IT product can be ascertained from social stakeholders. In a nutshell, these periods are merely the communication between the study subject and social stakeholders to the consumer.

2) The attitude and action toward the study subject and effect on the user

Mason's (1978) *Receipt*, *Influence on Receipt*, DeLone and McLean's (1992; 2003) *Use*, *Intention to Use*, and *User Satisfaction* are associated with how the consumer feels regarding the product after he/she believes that assimilated or received

information about the product is enough, leaving only two possible results, desire for the product or refusal of it. This period of consumer behavior to individual impact is limited.

3) The potential impact on the system (e.g., organization)

Mason's (1978) *Influence on System* and DeLone and McLean's (1992) *Organizational impact* are virtually the same stage. In the case of DeLone and McLean (2003), their *Net Benefit* means a combination of benefits from individual and organizational use of the study subject. Because one of the goals of this study is to establish the bridge between consumers and organizations, the organizational impact and individual impact should be separated.

Every model is limited in its application and there are always opportunities to design alternative model for different study contexts (Haryanto, 2014). Despite the fact that the IS Success model has a wealth of academic ideas, there is no related monetary scale and social stakeholder influence of the consumer in the IS Success model. Thus, its need some adaptation for specific study subject, such as eco-friendly IT product.

In order to create the model to predict green IT acceptance and impact on businesses, the model should be separated into three phases, as follow:

1) Green IT Introduction phase – A society motivates an individual in regard to the importance of green IT products, and green IT products promulgate through communication within society.

2) Green Individual Acceptance phase – An individual recognizes the significance of the green IT product and voluntarily uses it.

3) Green Organizational Impact phase – An individual shows intention to purchase product from companies that have environmental corporate image.

Table 2.1 Comparison of phases between theories

Study	Phase						
Shannon and Weaver (1949)	Technical Level	Semantic Level	Effectiveness (or Influence) Level				
Mason (1978)	Production	Product	Receipt	Influence on Receipt		Influence on System	
DeLone and McLean (1992)	System Quality	Information Quality	Use	User Satisfaction	Individual Impact	Organizational Impact	
DeLone and McLean (2003)	System Quality	Information Quality	Service Quality	Use / Intention to Use	User Satisfaction	Net Benefit (Individual + Org.)	
This Study	Green IT Introduction		Green Individual Acceptance			Green Organizational Impact	

Table 2.1 shows a comparison of stages between four theories and the current study, vertically. The phase separation idea is not just for embellishment, but is very useful when researchers want to explain each period of the phenomenon in the current and future study. Yet, the link from an individual's acceptance to an organizational impact still needs to be determined.

2.7.2 Bridge between Individual Phase and Organizational Phase

The bridges between the firm and its employees are frequently detailed in research (e.g., Mintzberg et al., 1998; Jones, 2001; DeLone and McLean, 1992; DeLone and McLean, 2003; Porter, 2004; Freeman; 2010; Kotler et al., 2012). In the broad sense, the impact from individual behavior has no sudden effect on an organization. There is a period of time, whether long or short, for the impact of an individual behavior to travel around an organization or a system. Many concepts, for instance, concept of collective versus individual, S-shaped curve and organizational culture, may show the bridge structure.

In organizational context, a collectivistic idea and an individual idea are different. For example, "collective tactics provide newcomers with common learning experiences designed to produce a standardized response to a situation" (Jones, 2001, p.

133). In contrast, individual tactics provide each newcomer with an experience that may be different from that experienced by others. Another example is collective creativity versus individual creativity. Parjanen (2012) defined collective creativity “as creative processes leading to creative products that are the results of interaction between two or more people”. A collective culture integrates all members to become one strong team, while an individual culture may sequestrate members’ visions. However, there is a link between individual and collective structure. In regard to the collective mind, Hargadon and Bechky (2006) explained that it “resides in the mindful interrelations between individuals and a system”, and individual behavior (action or comment) has impact on a system when considered by others, shape one, which in turn shapes the next. Everyone in a system, therefore, is involving, shaping and sharing outcomes. If there is no system or organization for an individual to care about, there is no aim (goal-orientation), intention and motivation for individual actions (feedback-seeking) in the first place (Yew-Jin and Wolff-Michael, 2007; Lehesvirta, 2004). An organization may start with improving individual efficacy (e.g., training) in order to enhance collective efficacy (Kozlowski and Salas, 1997 cited by Budworth, 2011). For example, sharing knowledge among members (knowledge management, KM) is a constructive way to raise company performance (Tilchin and Essawi, 2013). These facts are a few of the bridges between an individual to an organization which has a collective culture.

For S-shaped curve, Rogers (2003) pointed out that “when a quantity of idea adoption is plotted on a cumulative frequency basis over time, the resulting distribution is an S-shaped curve” (p. 23). Sharply or not, it depends on how a collective perception and an opinion leadership of idea distributer are.

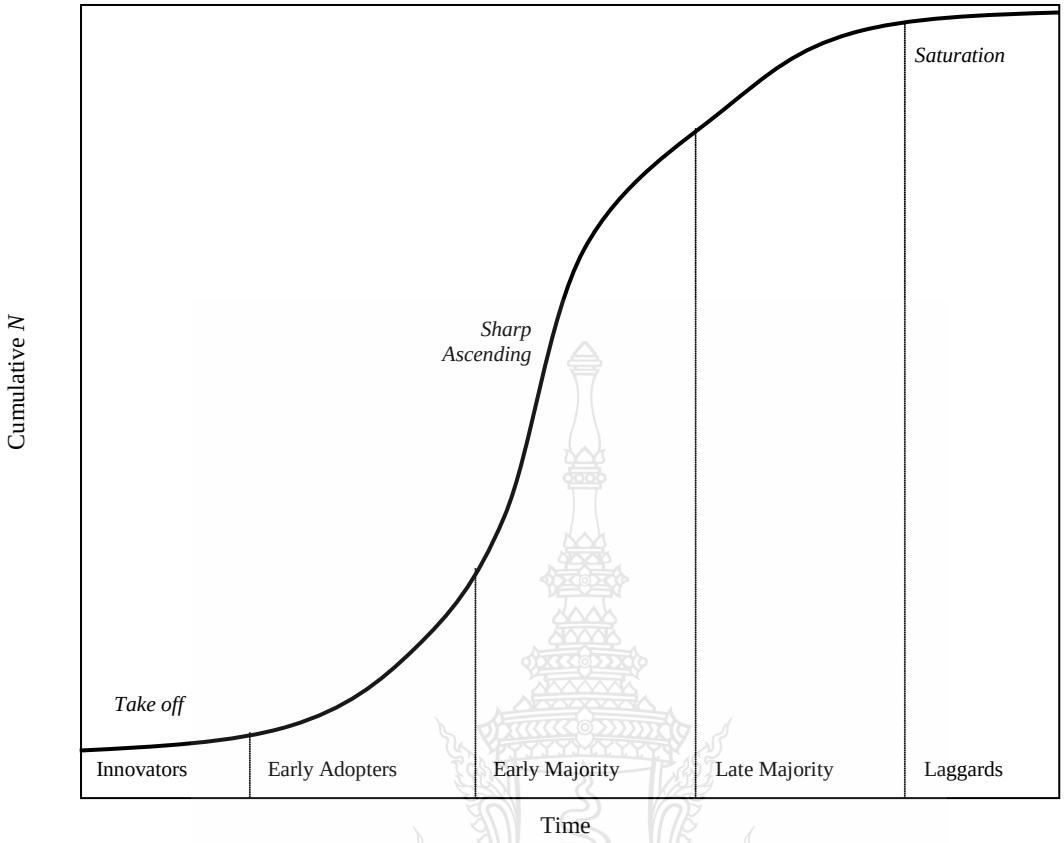


Figure 2.10 S-Shaped Growth Curve (Adapted from Rogers, 2003, pp. 273-281)

Mathematically, the S-shaped curve equates a logistic function (also known as sigmoidal curve (von Seggern, 2007 cited by Jónás, 2007; Furnham, 2012, p. 254). This is one example of S-shaped curve equations (2.1):

$$N(t) = \frac{M}{1 + e^{-k(x - x_0)}} \tag{2.1}$$

Where, *N(t)* is the number of new idea adopter at time *(t)*; *e* is Euler's number, which is the natural logarithm base that estimates 2.71828 (cited A001113); *M* is a maximum value of the curve; *k* is the steepness of the curve; and x_0 is the sigmoid midpoint value.

In the figure 2.10, the rate of adoption grows slowly in the beginning because there are just a few adopters in each period. When the majority of system accept a new

idea that a few adopters adopted before, the curve will accelerate to a maximum speed. The idea becomes obsolete and the adoption rate becomes gradually slow when there are a few late adopters or laggards left in the system (Rogers, 2003, p. 272).

If surrounding people or administrators perceive a consequence of an individual idea as a worthy one, rate of idea adoption will grow faster. However, the speed of the growth rate depends on an individual reputation and image (or opinion leadership as Rogers (2003) described) as well as quality of his/her overt behavior or idea. A chart of spreading impact from an individual action to a collective can be plotted in the S-shaped curve; from one to a few at a beginning, and from a few people to majority in a system. This will change old culture into a new one if there is no resistance. Mintzberg et al. (1998) believed that collective cognition (or idea) can be associated with an organizational culture (p. 263). Briody et al. (2012) and Adorisio (2008) suggested that cultural transformation operates when the majority of a system accepts the essence of change (cultural adaptiveness) and then reacts appropriately (cultural responsiveness) to the change. Every cultural transformation takes time (as explained with the S-shaped curve) for relationship building, providing appropriate, sufficient training and the like, to extenuate the resistance and give some direction in moving to the new ideal (Briody et al., 2012). The organizational value could be the resistance of the change. Many studies pointed out that changing culture of an organization means changing its value too (O'Relly, et al., 1991; Hellriege and Slocum, 2010; Cameron and Quinn, 2011 cited by Essawi, 2012) because such culture "is based on enduring value embodied in organizational norms, standard operating procedures and goals" (Jones, 2001, p. 131). Organizational value means criteria, standards or principles that people use to determine which types of behaviors are appropriate in an organization (Jones, 2001, p. 130). Thus, a new idea that is not fit to an organizational value may not be adopted by other units of the firm.

This study goes into a deeper explanation about the organizational culture in a section of a construct named *Perceived Green Organizational Policy*. In that section, this study points out the common environmental policies of the firm and how to measure policy perception of employees (or consumers).

2.8 Constructs in this study

This section scrutinizes literature to render eight constructs in the three phases:

1) Green IT Introduction: *Perceived Green Benefit*, *Resource Sacrifice*, *Noticeability* (on the Consumption Awareness) and *Social Influence* (on the Social Awareness)
2) Green Individual Acceptance: *Environmental Concern and Habit* and *Green Intention in Purchasing or Using IT Product*
3) Green Organizational Impact: *Intention to Supporting Green Imaged Business* and *Perceived Green Organizational Policy*

After this paragraph, this researcher expounds upon factors from all theories that are employed in this study. Because a model or theory of green IT adoption by consumer is rare or might not even exist, it is necessary to borrow many factors from various studies of IT/IS adoption and harmonizes them with an acceptance model.

2.8.1 Green IT Introduction

As discussed earlier, *Systems quality* was defined as the desirable technical and operational characteristics of an information system that can be measured via *Adaptability*, *Availability*, *Reliability*, *Response time* and *Usability* (DeLone and McLean, 2003; Petter et al., 2013; Mou and Cohen, 2015). Products that incorporate the green IT concept must be more environmentally friendly than the ones with no green label. In order to measure this concept, *Adaptability*, *Availability*, *Reliability*, *Response time* and *Usability* have less influence on the green IT product than measurements of unique green attributes, noticeability of the green indicator and its enticement. *Information quality* metrics concern the outputs but the major concern of the use of the green IT should be that it decreases the negative impact on the eco-system. Therefore, this study presents *Consumption Awareness* as a set of dimensions that can evaluate the quality of the consumers' perception of the environmentally friendly specifications, and *Social Awareness* as a dimension to observe the quality of environmental friendliness of the social sphere.

1) Consumption Awareness: *Perceived Green Benefit*

According to Ajzen and Fishbein (1980) and Ajzen (1991), attitude is an important thing for an individual to perform overt behavior. In order to convince the

consumer to buy and use the green IT product, its benefits must be shown vividly to improve his/her attitude toward the green IT product. This construct, *Perceived Green Benefit*, is based on the relative advantage in DOI. *Relative Advantage* is the degree to which an innovation is perceived as being better than the idea it supersedes (Rogers, 2003, p.229; Schiffman et al., 2010, p. 453; Severin and Tankard, 2010, p. 208). By definition, *Relative Advantage* does not only relate to job enhancement, the focus area is wider than *Perceived Usefulness* in TAM3 and has more parameters than the *Performance Expectancy* in UTAUT2. Oliver (2007) suggested that *Relative Advantage* has sub-dimensions for different sorts of innovation. In the dimension of green IT, for example, a newly designed laptop computer utilizes a reduced toxic heavy-metal battery, has a more energy efficient CPU, a solid-state drive, and uses biodegradable vinyl in its casing. This new laptop would attract the consumer who is environmentally aware due to its less negative impact on the earth.

In a meta-analysis by Weigel et al. (2014), a positive connection between *Relative Advantage* and some technology adoptions are clearly visible. However, in their list of previous studies innovation, two of 55 studies were related to green context, which were a paperless tax return (Ojha et al., 2009) and energy conservation interventions (Völlink et al., 2002). These two studies discovered that *Relative Advantage* has up to medium value of positive correlation with adoption of a paperless tax return and energy conservation interventions, which were not very strong indicators when compared with non-green innovations. Study of the green innovation is needed more and more to reveal the relationship and this might be a challenge for all researchers who try to figure out how a framework to predict the green technology product acceptance should be. From the previous and the current paragraphs, *Relative Advantage* is appropriate to use as a base of the *Perceived Green Benefit* in this study because of its versatility.

Perceived Benefit, a construct in HBM, can be used to add weight to *Relative Advantage* due to its function. According to Glanz et at. (2008), *Perceived Benefit* is defined as a belief in efficacy of the advised action to reduce risk or seriousness of impact, and its functions define actions necessary and clarify the positive effects to be expected (p. 48). Although *Perceived Benefit* was not the best predictor (the highest

Cronbach's Alpha value) in four different cultures (p. 52), *Perceived Benefit* is applicable to non-medical or non-health-related issues, such as the financial savings related to quitting smoking (p. 47). This shows the adaptability of the application of *Perceived Benefit*. Impact on human well-being (both psychological and physical) in purchase of products, including IT and long term use of such products, needs to be scrutinized (Hartmann et al., 2005; Hartmann and Apaolaza-Ibáñez, 2012; Haryanto, 2014; Holbrook & Moore, 1981)

In UTAUT2, *Hedonic Motivation* has been defined as the fun or pleasure derived from using a technology (Venkatesh et al., 2012; Brown and Venkatesh, 2005). *Hedonic Motivation* has been found that it has an influence on intention to use technology product with has *Age, Gender* and *Experience* as moderating effects; there is the strongest effect on young men with less experience (Venkatesh et al., 2012). It sounds similar to *Perceived Enjoyment* in the third version of TAM. At this point a new question arose; "is there a difference between common IT products and green IT products in regard to enjoyment?" This is reminiscent of *Complexity,* Rogers (2003) wrote that it may not be as important as *Relative Advantage* or *Compatibility* for many familiar innovations, but not for some new innovations (p. 257). Although Venkatesh et al. (2012) pointed out that *Hedonic Motivation* is more important than *Performance Expectancy* for the use of a technology product in non-organizational contexts, *Hedonic Motivation* or *Perceived Enjoyment* may not be significant for the adoption of the green IT product as well as the *Complexity,* For example, the distinction in usage between smartphones with and without green design should not exist when they have similar appearances and capabilities.

On the other end of spectrum, *Hedonic Motivation, Perceived Enjoyment* and other metrics of an individual happiness can be useful academic mixtures for the measurement of perceived benefit of the green IT product. However, enjoyment is not the impetus behind the green IT concept; the sense of fulfillment the consumer receives for participation in environmental protection is much more a part of it. By comparison, many people donate money to support those affected by natural disasters; surely those who donate will perceive this as righteousness and, in return, feel some happiness. Tierney et al. (2011) studied green practices in travel industry and what the authors

discovered asserts that many tourists feel more pleasure with environmentally friendly travel businesses than non-green businesses. Hartmann and Apaolaza-Ibáñez (2012) suggested that support of green products can result in moral satisfaction (or *Psychological Benefit*) to the individual. In addition to the utility of the green IT product, the peace of mind over using a product which has no green label becomes a factor. According to the previous sentence and along with the *Perceived Benefit* from HBM that relates to the recognition of mental profits, consumer delight is one of other benefits that the green IT product can give its users. Emotional benefit is construed to be an important factor in the adoption of green products (Haryanto, 2014).

In addition, the other side of eco-friendly benefit is safety. Fear can motivate a protective response, or the intention to respond (Rogers, 1975 cited by Severin and Tankard, 2010, p. 162). Herbes and Ramme (2014) studied green electricity consumption of two actors; consumers and marketers and summarized that perceived *Psychological Benefit* is significant to the acceptance of the green product. People believe that supporting eco-friendly product reduces the rage of climate change (Herbes and Ramme, 2014). When consumers are willing to use green products because they desire to avoid the terrible consequences of global warming, it implies that they want to preserve nature as much as possible for their sakes and the sakes of their progeny. Rather than just enjoyment, they also seek security. According to *Perceived Benefit* in HBM, one of its key words that Becker et al. (1978) used as a measurement item was "Do not recover … by waiting". For example, if the patient waits or declines to take medication, his/her health will be impacted. The patient afraid of suffering or death from disease will follow a doctor's instruction for his/her personal well-being. In this case, enjoyment is not a factor in the patient's mind; all he/she has hopes for is survival. As discussed, this feeling is not only amusement, delight, fear and insecurity, it is also integrated into *Psychological Benefit* as Herbes, Ramme (2014), Hartmann and Apaolaza-Ibáñez (2012) expressed. Therefore, this study added the concept of *Psychological Benefit* of the purchase and use of the green product into this study.

Gender observation may show different results. According to Harvey (1990) and Jones and Posnett (1991) that female consumers have strong tendency to give, they should care more about the environment (Chang and Cheng, 2015) and benefits from

environmental friendliness of green IT product than male consumers. However, Clement (2013) found that education of consumers has effect on purchasing decision and it is needed to minimize deception, such as advertising that provides false or misleading information of a product or service (Wai-ling, 2004). Education may be seen as experience (‘educational experience’ in Richardson, 2005) and be used as a moderating factor between perceived green benefits of IT products and purchasing behavior.

This study integrated applications of *Relative Advantage*, *Perceived Benefit* and *Psychological Benefit* to draw a new construct titled ‘*Perceived Green Benefit’*, and defined it as the degree to which an innovation is perceived as being more physically and psychologically appropriate than the idea it supersedes to reduce negative impact on the environmental and human health.

Table 2.2 Review of discussed constructs in Perceived Green Benefit

Dimension	Definition/Explanation	Measurement Item
Relative Advantage (Rogers, 2003)	The degree to which an innovation is perceived as being better than the idea it supersedes (Rogers, 2003, p. 476).	Accomplish ... more quickly Improves ... quality Make ... easily enhances Advantageous Enhances ... effectiveness Gives ... greater control Increases ... productivity (Moore and Benbasat, 1991)
Perceived Usefulness (Venkatesh and Bale, 2008)	The extent to which a person believes that using IT will enhance his or her job performance (Venkatesh and Bale, 2008).	Improves … performance Increases … productivity Enhances … effectiveness Useful (Venkatesh and Bale, 2008)

Table 2.2 Review of discussed constructs in Perceived Green Benefit (Cont.)

Dimension	Definition/Explanation	Measurement Item
Performance Expectancy (Venkatesh et al., 2003; 2012)	The degree to which using a technology will provide benefits to consumers in performing certain activities (Venkatesh et al., 2012).	Useful Accomplish … more quickly Increases … productivity (Venkatesh et al., 2012)
Perceived Benefit (HBM)	Belief in efficacy of the advised action to reduce risk or seriousness of impact (Glanz et at., 2008, p. 48).	Prevents … risk Decrease … risk (Janz and Becker, 1984) Feels better Helps but not cure Prevents … disease Prevents an attack Do not recover … by waiting (Becker et al., 1978)
Hedonic Motivation (Venkatesh et al., 2012)	The fun or pleasure derived from using a technology (Venkatesh et al., 2012).	Using … is fun Using … is enjoyable Using … is very entertaining (Venkatesh et al., 2012)
Perceived Enjoyment (Venkatesh and Bale, 2008)	The extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use (Venkatesh and Bala, 2008).	I find using ... to be enjoyable The actual process of using … is pleasant I have fun using … (Venkatesh and Bala, 2008)

Table 2.2 Review of discussed constructs in Perceived Green Benefit (Cont.)

Dimension	Definition/Explanation	Measurement Item
Psychological Benefit (Hartmann and Apaolaza-Ibáñez, 2012)	Warm glow feelings derived from the moral satisfaction of contribution to the common good environment; self-expressive benefits from conspicuous environmentally sound consumption; and nature experience evoked by natural brand imagery (Hartmann and Apaolaza-Ibáñez, 2012).	… feel good because they help to protect the environment … have the feeling of contributing to the well-being of humanity and nature … can feel better because they don't harm the environment … express my environmental concern … care about environmental conservation perceive … to be concerned about the environment (Hartmann and Apaolaza-Ibáñez, 2012)
Perceived Green Benefit (This study)	The degree to which an innovation is perceived as being more physically and psychologically appropriate than the idea it supersedes to reduce negative impact on the environmental and human health.	[Physical Benefit] The use of … reduces the growth of electronic waste. … improves efficiency of energy consumption. … reduces risk of damage to the environment and human health. [Psychological Benefit] … makes I/you feel you are participating in environmental protection.

2) Consumption Awareness: *Resource Sacrifice*

Positive attitude toward a product is the essence to making people accept it (Ajzen and Fishbein, 1980; Ajzen, 1991), but its worthiness must always be considered a factor as well. The reason why Venkatesh et al. (2012) add a monetary measurement into their UTAUT as a new construct is discussed earlier in the previous section. An employer decides which technology to invest in, not employees. As a consumer, a person has to pay for an IT product that one want to use, not an employer. This illustrates the relevance of *Price Value*. Venkatesh et al. (2012) cited three previous studies (Chan et al., 2008; Dodds et al., 1991; Zeithaml, 1988) and observed that the consumer will buy a technology product when he/she understands that benefits of the product are commensurate with price. For example, Venkatesh et al. (2012) cited Zeithaml (1988) and explained that monetary aspect and quality (or quantity) of product/service are confluent. Venkatesh et al. (2012) pointed out that *Price Value* has moderating factors, which are *Age* and *Gender*; there must be moderating effects for the adoption of green IT products as well. The product price is a vital factor (Shankarmahesh, 2006 cited by Schiffman et al., 2010, p. 156; Schiffman et al., 2010, p. 194) in the marketplace; vendors often synchronize their product price to compete against each other (Oh and Lucas Jr., 2006). In some cases, business strategies may not help move the products of the firm, even with sales promotions. Godinho de Matos et al. (2014) has shown that even when there is peer influence in IT gadget adoption, such as the iPhone, it may be difficult to convince consumers to purchase such costly products even with discounted prices.

Some environmental-friendly IT product costs move in opposite directions between the system and its required additions. For example, if the price of an e-reader is higher than the cost of an e-book (mostly, .pdf file format) (Hao and Fan, 2014), the consumer invests in a high price system to obtain cheaper or free materials, which is the better deal with long-term usage. Some consumers shunned green products when they found that they had to spend extra money to go green (Ishaswini and Datta, 2011; Luzio and Lemke, 2013).

Cost and unclear value in the opinion of key people in many businesses are the biggest disincentive to firms in adopting green IT (Molla et al., 2009; Dedrick, 2010).

Although green IT provides cost savings in the long term for the firm, it may not be accepted by business owners (Dedrick, 2010). Whether it is at the business level or the individual level; if there is a perceived risk of investment for an unclear benefit), it could be perceived as a monetary sacrifice. Change of the firm, such as corporate environmental responsibility, lead to increase costs (Husted and Allen, 2007) and result in higher product price.

On the individual level, Herbes and Ramme (2014) illustrated the framework of consumers' purchasing of green energy products and *Household Income* was one of the influence dimensions. Together with Rogers (2003), in the adopter categories, people who are *Innovators* (or *Venturesome*) have an ability to obtain new innovations faster than other categories due to financial stability (p. 282). If the green IT product presents an equal or lower price compared to a non-green one, it will be accepted by consumers (Berndt and Gikonyo, 2012). Accordingly, the financial dimension proved to be an important construct. Nevertheless, if consumers have to pay a premium price to obtain the green IT product with doubtful green benefits, there is a high chance for many consumers to ignore green labels.

Not only extra price for environmental friendliness was a barricade to adopt the green IT, but also reduce of IT product capability. Schmidt et al. (2010) explained that performance was the dominant criteria to purchasing of technology products, such as PC, but female customers (mostly non gamers) value environmentally friendly attributes. In general, most women are more generous givers than men (Jones and Posnett, 1991; Harvey, 1990 cited by Chang and Cheng, 2015). *Gender* is a moderating factor in this context of the adoption of the green IT product. In a situation where customers must pay more money and sacrifice some performance, market share of this green IT product will diminish accordingly. In some cultures, monetary sacrifice for eco-friendliness is preferable. Tierney et al. (2011) discovered that consumers are willing to pay a premium price for green practices in the tourism industry even though many of them do not know which product and service is eco-friendly. Traveling and using IT products are vastly different because in traveling everything is easily apparent unlike when using an IT product. Higher prices can imply higher quality as Dodds et al.

(1991) explained, but with perceived sacrifice of performance or other resources, it can be worthless.

At this point, monetary sacrifice and functional sacrifice are already discussed; temporal sacrifice should be considered as a resource too. Yoonjae and Sangyeon (2012) began an abstract stating that both time and money can be considered as resources but several researchers found that the two are different. Zauberman and Lynch (2005) said that time, as a resource, is more flexible than finance, and people may consume more time than money when purchasing hedonic products as Okada (2005) wrote because product emotional value is perceived by the consumer (Bellenger et al., 1976 cited by Chang and Cheng, 2015). Consequently, the consumer might spend more time than money, Yoonjae and Sangyeon (2012) expressed. Cogoy (2010) explained that the basic needs of people must be adequately met: if people have to spend too much time to identify targeted products in their consumption, they will experience a feeling of tediousness soon. It is hard to say what the tolerable time allocation for green IT product designation should be because it must be calculated from the buyer emotion as the primary criteria. One green IT product can be hedonic and utilitarian at the same time, for example, an eco-friendly smartphone which has symbolic values and utility values. According to Yoonjae and Sangyeon (2012), in the case where buyers see the green IT product as utilitarian, they will be willing to spend more time to examine it before spending the money. On the other hand, if green IT is viewed as hedonic or symbolic merchandise; money will be spent more freely than time. It depends on the consumer's position. This study has essentially three sub-dimensions of the term '*Resource Sacrifice*': monetary sacrifice, function sacrifice and temporal sacrifice.

Thus, a construct to measure the green IT product regarding price, time and value should be named *Resource Sacrifice*. The *Resource Sacrifice* can be defined as the degree to which the consumer willing to give money, reduce functionality and spend time to obtain an innovation. Not only are *Gender* and *Age* moderating effects, *Experience* (Educational Experience) also plays a role.

Table 2.3 Review of discussed constructs for Resource Sacrifice

Dimension	Definition/Explanation	Measurement Item
Perceived Value Indicators (Dodds et al., 1991)	The cognitive tradeoff between perceptions of quality and sacrifice results in perceptions of value (Dodds et al., 1991).	This … is a (very good - very poor value for the money) At the price shown the … is (very economical - very uneconomical) … is considered to be a good buy The price shown for the … is (very acceptable - very unacceptable) This product appears to be a bargain (Dodds et al. 1991)
Price Value (Venkatesh et al., 2012)	Consumers' cognitive tradeoff between the perceived benefits of the applications and the monetary cost for using them (Venkatesh et al., 2012).	… is reasonably priced … is a good value for the money; At the current price … provides a good value (Venkatesh et al., 2012)
Time/Money (Yoonjae and Sangyeon, 2012)	Both time and money can be considered as resources, when spending time as a resource instead of money, prefer utilitarian products to hedonic products (Yoonjae and Sangyeon, 2012).	e.g., Money spending; time spending (Yoonjae and Sangyeon, 2012) This purchase makes me feel alive This purchase makes me feel deeply involved This purchase is meaningful to me (Waterman et al., 2008)
Performance oriented (Schmidt et al., 2010)	Performance remains the dominant criteria when buying an IT product (Schmidt et al., 2010).	This dimension was used to measure the rate of purchasing when performance as the main criteria.

Table 2.3 Review of discussed constructs for Resource Sacrifice (Cont.)

Dimension	Definition/Explanation	Measurement Item
Resource Sacrifice (This study)	The degree to which the consumer is willing to spend money, accept reduced functionality and spend time to obtain an innovation.	[Financial Resource] It is worth paying a premium if it protects the environment. [Capability Sacrifice] I don't mind reduced performance of an IT product if it will help the environment. [Temporal Resource] Taking some time to compare energy efficiency (as an example) among IT products isn't a waste of time.

3) Consumption Awareness: *Noticeability*

In this study, *Noticeability* is defined as the degree of visibility, recognition and understandability of the environmental label. Generally speaking, green products and services are likely to be abstract objects in most consumers' perspective. Many consumers have no idea about characteristics of the green product (Pickett-Baker and Ozaki, 2008; Juwaheer et al., 2012). Not surprisingly, those consumers have no intention to buy and use it. The green design concept by Velte et al. (2008) is showing in table 2.4.

Table 2.4 Green design concept of products (Velte et al., 2008, p.139)

Design	Explanation
Design for repair	Some equipment is not designed so that it can be repaired (at least not easily) and is simply seen as disposable. Include as many elements as possible that can be repaired.
Design for upgradability	This goes hand-in-hand with the notion of being reparable. Build systems that can be upgraded, rather than having to replace entire components when needed.

Table 2.4 Green design concept of products (Velte et al., 2008, p.139) (Cont.)

Design	Explanation
Design to minimize power consumption	As mentioned before, the less power you use, the less money you'll spend and the less electricity that will have to be generated. Your ledger wins; the environment wins.
Design for recycling or a clean disposal	This means designing systems with material types that are easily recycled or can easily find a second life when you're done with them. It can also mean including elements that are less toxic, such as using RoHS-compliant equipment or EPEAT-rated equipment.

Generally speaking, green products and services are likely to be abstract objects in the perspective of most consumers. Tierney et al. (2011) observed tourists' willingness to purchase and use eco-friendly travel products and services, 87.3 percents of the respondents answered either "No, Don't know or Missing", which translates that they do not know what green products or service look like. Consumers may err by assuming that different products, which have different characteristics, are similar and can be substituted (Walsh and Mitchell, 2005; Walsh et al., 2010; Walsh et al., 2012). Many consumers have no idea about the characteristics of the green products (Pickett-Baker and Ozaki, 2008; Juwaheer *et al*., 2012). Not surprisingly, those consumers have no intention to search for it. Whenever the consumer feels that he/she has to waste huge periods of time in order to seek and study the green IT product, boredom is the only consequence (Cogoy, 2010). One of the solutions to overcoming this problem is advertising; it will help to reduce the amount of wasted temporal resources on consumer noticeability of the green IT product. To be more effective, consumers should have researched environmental issues and benefits of green product and service themselves (Ozaki, 2011). Consumers have to understand how to distinguish green products by keeping an eye out for green indicators. According to Velte et al. (2008) who already elaborated in the green IT section in this study, if the green IT products have a prominent green indicator, such as the green label and the energy star, on its package or surface, which notifies the consumer that the product is manufactured with green

design, the consumer may be swayed. Zhao et al. (2013) discovered that the level of educational has a positive influence in noticeability of green products.

In contrast, many studies (e.g., Truffer et al., 2001; Banerjee and Solomon, 2003; Kaenzig et al., 2013; Herbes and Ramme, 2014) suggested that eco-labels are significant but not enough to summon consumers alone; it indicated no or rarely when questioned about the use of eco-labels. Sadly, it seems that green indicators are important criteria that consumers enjoy ignoring. With this in mind, well-made advertising for green IT product is more than crucial. One reason that consumers choose to ignore the green label is their perceived unacceptable image of a labels in general, such as the Thai Q-mark case. The deputy director of the Thai Holistic Health Foundation stated that the samples of Q-mark products had higher levels of pesticide contamination than produce without the Q-mark guarantee (Charoensuthipan and Fredrickson, 2014). This construct can be measured by observing individual recognition and understandability of environment-friendly symbols as in the study of Zhao et al. (2013).

Table 2.5 Review of discussed constructs in Noticeability

Dimension	Definition/Explanation	Measurement Item
Knowledge of green consumption items (Zhao et al., 2013)	N/A	Recognize the sign of environment-friendly products: [1 = True/0 = False] (1)  ; (2)  ; (3)  ; (4)  ; (5)  (Zhao et al., 2013).

Table 2.5 Review of discussed constructs in Noticeability (Cont.)

Dimension	Definition/Explanation	Measurement Item
Noticeability (This study)	The degree of visibility, recognition and understandability of the environmental label.	I understand the meaning and importance of these symbols: [2 = Understand/1 = Don't understand] (1)  ; (2)  ; (3)  ; (4)  ; (5)  ; (6) 

In the study of Zhao et al. (2013), there are two choices for recognition of eco-label; answerable on a two-category 'true/false' format with 1 point for correct answer and 0 for wrong answers, which is a nominal scale. Adapted from Zhao et al. (2013), this study changes their concept from 'true/false' to a two-point scale to measure participant knowledge regarding six eco-indicators. With these three constructs in the group name *Consumption Awareness*, the first hypothesis is created.

Hypothesis 1: Consumption Awareness (*Perceived Green Benefit*, *Resource Sacrifice* and *Noticeability*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Age*, *Gender* and *Educational Experience* as moderating factors.

4) Social Awareness: *Social influence*

The rate of innovation adoption has *Observability*, the degree to which the results of an innovation are visible to others, as one of its drivers (Rogers, 2003, p. 258). People who have collectivistic mindset have more concern of society than people who have individualistic mindset (Markus and Kitayama, 1991 cited by Chang and Cheng,

2015). This suggests that peers have influence on individual decision making in innovation adoption (but not for everybody). In the first UTAUT, Venkatesh et al. (2003) formulated that *Social Influence* is the degree to which an individual perceives the importance of a new system through interaction with other social stakeholders. They found that *Gender*, *Age* and *Experience* are moderating effects of *Social Influence* as the effect is stronger on women and older staff members who are under conditions of mandated operational decisions and with limited experience with the IS resulting from those decisions. In the UTAUT2, Venkatesh et al. (2012) redefined that *Social Influence* is the degree to which the consumer perceives that influential people, including family and friends, believe the consumer had better use a particular technology. Two different things can be seen as the same or not, it likely depends on the social impact. For example, Jonathan et al. (2013) studied intention to download music files; they summarized that social environment, such as close friends and family, has positive effect in deciding whether or not to buy from legitimate sources or download for free from torrent sites. Similarly, people will choose an IT product that has the green labels (e.g., the Energy Star) if there is influence from family and friends. If no person of influence gives an individual reason to be concerned about the green IT product, the individual may assume that all IT gadgets are similar. Furthermore, the positive relationship between the influence of society and the decision to use a particular technology appears to be universal in several literature (e.g., Arbore et al., 2014; Hong and Tam, 2006; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000; Weigel et al., 2014; Dohan and Tan, 2014; Hu et al., 2013; Freundlieb and Teuteberg, 2012; Polites and Karahanna, 2012; Gottschalk and Kirn, 2013; Schiffman et al., 2010, p. 36, p. 254; Futrell, 2011, p. 131).

According to Venkatesh et al. (2003), *Social Influence* is evolved from three variables that are *Subjective Norm* (*Normative Beliefs*), *Social Factor*, and *Image*. *Social Influence* includes the positive relationship of friends, relatives, media (Venkatesh and Brown, 2001), colleagues (Taylor and Todd, 1995b). Godinho de Matos et al. (2014) suggested that the influence of friends can increase the chance of technology adoption. Culture has a significant impact on *Behavioral Intention* to use an IT product by the consumer (Bandyopadhyay and Fraccastoro, 2007).

Media, one of stakeholders of the individual, can be through television, radio, newspapers, the internet (Schiffman et al., 2010, pp. 283-284; Severin and Tankard, 2010, p. 6-8) and so forth, is a powerful tool for businesses to attract their customers, and for a government to persuade its people. However, before interact with media; good opinion leaders are necessary for private and public sectors. Businesses often hire famous spokespeople to promote their merchandise. Those famous people on stage and screen can be opinion leaders according to the DOI. Rogers (2003) explicated that such a leader has the ability to influence ideas and behavior of others, especially followers, to desire an innovation (pp. 436-471). The opinion leader can be a male, a female, or a group without age restriction. Sometimes, the influence of the opinion leader has more sway than the allure of the technology itself (Sarker et al., 2005). Opinion leadership abilities like sense of humor (Gkorezis et al., 2011) in communication with the consumer (Wang et al., 2012a; Wang et al., 2012b) can help a business raise its sales and profit easily.

According to "The Strength-of-Weak-Ties" by Mark S. Granovetter, people who are close (e.g., friends, family) have less influence on an individual than somebody who is more distant (in social status and physical distance) (Rogers, 2003, pp. 339-341). For example, do children obey their parents or are they more likely to fall under the influence of their friends? An effective opinion leader should have more social distance from those they influence, such as a superstar and his/her followers. In this regard, technology, such as an online social network, can use to persuade people (Agarwal et al., 2012; Mathur and Mathur, 2000; Habib et al., 2010; Juwaheer et al., 2012; Severin and Tankard, 2010, p. 7) for environmental friendly consumption as Zhang (2012) explained. Thus, the act of using opinion leaders to disseminate information via media is a powerful strategy to encourage people to adopt technology products.

This study proposes friends, media, relatives, and coworkers as stakeholders of the individual to measure the effect of *Social Influence* on willingness to adopt green IT products with *Age*, *Gender* and *Experience* as moderating factor, as Venkatesh et al. (2003; 2012) suggests.

Hypothesis 2: Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender*, *Age* and *Experience* as moderating factors.

Table 2.6 Review of discussed constructs in Social Influence

Dimension	Definition/Explanation	Measurement Item
Social Influence (Venkatesh et al., 2012)	The degree to which the consumer perceives that influential people, such as family and friends, believe the consumer had better use a particular technology. (Venkatesh et al., 2012)	People who are important to me think that I should use … ; People who influence my behavior think that I should use … ; People whose opinions that I value prefer that I use … (Venkatesh et al., 2012)
Subjective Norm (Venkatesh and Bala, 2008).	The degree to which an individual perceives that most people who are important to him think he should or should not use the system (Venkatesh and Bala, 2008).	People who influence my behavior think that I should use … ; People who are important think that I should use ; The senior management of this business has been helpful in the use of … ; In general, the organization has supported the use of …
Social Factor (Thompson et al., 1991)	The individual's internalization of the reference groups' subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations (Triandis, 1980)	The proportion of departmental co-workers who use ... ; The senior management of this business unit has been helpful in introducing … ; My boss is very supportive of ... ; In general, the organization has supported the introduction of ... (Thompson et al., 1991)

Table 2.6 Review of discussed constructs in Social Influence (Cont.)

Dimension	Definition/Explanation	Measurement Item
Image (Moore and Benbasat, 1991)	The degree to which use of an innovation is perceived to enhance one's image or status in one's social sphere (Moore and Benbasat, 1991)	Using … improves my image within … ; Others in … see me as a more valuable … because of my use of … ; People in … who use … have more prestige than those who do not ; People in … who use … have a high profile ; Having … is a status symbol in … (Moore and Benbasat, 1991)
Opinion Leadership (Rogers, 2003)	The degree to which an individual is able informally to influence other individuals' attitudes or overt behavior in a desired way with relative frequency (Rogers, 2003, p. 475)	N/A
Peer & Superior influence (Taylor and Todd, 1995b)	Peer influence and Superior influence are sub-dimensions of Subjective Norm.	[Peer influence] My friends would think that I should use … ; Generally speaking, I want to do what my friend think I should do ; My classmates would think that I should use; Generally speaking, I want to do what my classmates think I should do. [Superior influence] My professors would think that I should use ; Generally speaking, I want to do what my professors think I should do ; I will have to use … because my professors require it (Taylor and Todd, 1995b).

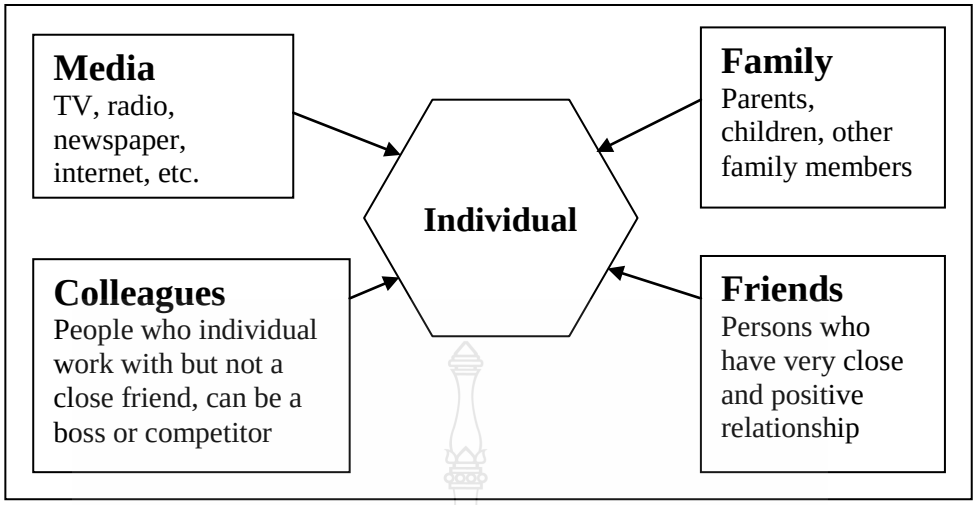


Figure 2.11 Map of Social Influence in this Study

2.9.2 Green Individual Acceptance

After the consumers acknowledge attributes of the green IT products and its social significance, a personal awareness of negative impact on the environment will help the consumer to accept green IT more readily.

1) *Environmental Concern and Habit*

For the purpose of this study, the first construct to measure the level of personal and organizational environmental friendliness is *Environmental Concern* (Dunlap and Van Liere, 1978; Van Liere and Dunlap, 1980; Van Liere, 1981) and it has matured to become the New Environmental Paradigm (NEP) by Dunlap et al. (2000). The NEP is a tool to measure beliefs about humanity's ability to upset the balance of nature, the existence of limits to growth for human societies and humanity's right to rule over the rest of nature (Dunlap et al., 2000). Therefore, the NEP is also a scale to observe *Environmental Concern*. Many previous studies utilized *Environmental Concern* as a surrogate for social responsibility (Roberts, 1996). But this construct still plays a significant role in many studies, to this day. *Environmental Concern* is an integrated set of attitudes and beliefs of the individual toward the environment and his/her degree of concern with environmental issues (Zhao et al., 2013; Kim and Choi, 2005) and the NEP is used in several study contexts (e.g., Ogunbode, 2013; Kopnina, 2012; McDonald and Patterson, 2007; Sprehn et al., 2013; Steel et al., 2015; Hsu and

Lin, 2015; Gürlük, 2013; Arnocky et al., 2012) The scales of the NEP can be breakdown into five section, which are reality of limits to growth, anti-anthropocentrism, fragility of nature's balance, rejection of exceptionalism and possibility of an eco-crisis (Dunlap et al., 2000; Ogunbode, 2013).

Stough-Hunter et al. (2014) reported that quality perception of local water resources and significance of water quality improvement are important predictors to measure *Environmental Concern*. People who live near a water source are more likely to understand the importance of the water source and prohibit any water contamination, such as abandoned mine waste, for example. Furnham (2012) believed that villagers in the countryside have lower selfishness than city-dwellers as the urban overload hypothesis suggests (p. 126). What Furnham (2012) believed is applicable to the water situation of Thailand. Thai Pollution Control Department (2014) mapped the water pollution situation that most canals and rivers in urban areas are polluted, especially Bangkok and its perimeters (pp. 3-8). IT product manufacturers model themselves to respond to the demand of the consumers, more often consumers who are in urban areas. As one of the stakeholders of the business, the consumers could define their environmental friendliness to generate environmental issues for the firm (Johansson and Winroth, 2010). *Environmental Concern* can be seen as an *Ethical Driver*, which Molla (2008) pointed out that "refers to the pursuit of socially responsible business practices and good corporate citizenship". This *Ethical Driver* can persuade key people of organizations to have green preferences that are accepted by society (Sen et al., 2006; by Molla, 2008). Business people are also consumers; *Ethical Driver* motivates key players to adopt the green IT for the firm as well as motivates consumers to adopt greener products whether IT or not.

However, *Environmental Concern* is not only important in the organizational context, but it is also important to consumers in evaluating their decisions before purchasing (Schiffman et al., 2008; Berndt and Gikonyo, 2012) and demographic characteristics, such as Age and Gender, can moderate this relationship (Diamantopoulos et al., 2003). This section focuses on *Environmental Concern* at the individual level. Although the consumer and the organization are not the same thing, but their concern for the environment still have similarity. The *Environmental Concern* of

the consumer has positive impact on his/her attitudes and behaviors toward eco-friendly products even through higher costs are required (Hanson, 2013; Hedlund, 2011). Attitude toward environmental issues has an influence on a consumer willingness to pay for green products and services (Herbes and Ramme, 2014). For example, customers who participate in green practices (actions that protect the environment) at home will visit restaurants, which are eco-friendly, more often (DiPietro et al., 2013), and green tourists willing to pay extra price for green hotels that have good green promotions, reputation, and image (Chan, 2013a; Chan, 2013b; Tierney et al., 2011). Generally speaking, there are numerous green practices of the individual but they can be seen as environmentally friendly habits. The word 'Habit' is defined as 'an acquired behavior pattern regularly followed until it has become almost involuntary' or 'a particular practice, custom, or usage' ("Habit", 2015). It is a set of behaviors that an individual often engage in. In UTAUT2, *Habit* means automatic human behaviors due to previous learning or an individual automaticity (Venkatesh et al., 2012; Limayem et al. 2007; Kim et al., 2005). This construct can be used to predict the willingness to purchase and use IT products in the future. Venkatesh et al. (2012) discovered that an IT involved habit's effect will be stronger for mature men who have more experience. *Habit* is a result and a reason for the individual to continuing usage or repurchase of an IT product or service. On the other side of the coin, careless habit can be a reason for ignorance. People could say that they care the environment but it does not mean they are aware of their environmentally careless habits, such as using plastic bags every time they go shopping and tossing depleted batteries into the trash instead of disposing of them responsibly.

Use of plastic bags has become a major concern of developed and developing countries. The average life expectancy of people who are born between 2015 and 2020 is 71.7 years (UNDESA, 2015a), but a plastic bag needs approximately 450 years to decompose (Pollution Control Department, 2012). It implies that plastic bags from today will exist for another six generations. The Pollution Control Department of Thailand (2012) summarized that Thai people make more than 14 million tons of waste, including plastic bags, but less than 70% of that waste is managed properly. Typically, a plastic bag is made of petroleum, if the use of new plastic bags is reduced, the amount

of crude oil saving will increase (Yamashita and Toyofuku, 2012). An awareness of this issues results into behavioral changes (Synthia and Kabir, 2015). However, high household income and large household size were found to incur rapid plastic waste generation (Thanh et al., 2011).

Plastic bags take 450 years for decomposition but foam containers are worse. The Pollution Control Department of Thailand (2012) pointed out that Styrofoam is not biodegradable and cannot be recycled. The use of Styrofoam is another grave global issue (e.g., Mann, 2015; Rodriguez, 2011; Bryan, 2015; Wilson, 2012; Anthony, 2015; Rodríguez, 2011). Styrofoam containers are highly overused in such things as food packages and shockproof containers for IT gadgets. If the use of plastic bags and polystyrene boxes are merely for the short-term, littering behavior is the only result. Negative impact of littering is not just on the environment but the economy too, such as travel industry (Rodríguez-Rodríguez, 2012).

Reckless electricity use is an issue for many countries. Fischer (2008) suggested that energy consumption is rising exponentially and sustainable electricity consumption is far from the minds of most people. Fischer (2008) also pointed out the term 'electricity conservation' that it is not limited to just the energy saving, but also the purchase and use power efficient products, such as computer equipment. Thai Energy Policy and Planning Office (EPPO) launched a campaign in the year 2005 by displaying a poster to enlighten citizens about electricity conservation. The electricity conservation poster shows examples of saving energy behaviors for household products, such as switching off a computer monitor if you are not using it, and looking the for Energy Star symbol every time you purchase IT products. As a result, many Thai families have strict electricity conservation policies; parents always tell their children to turn off energy consuming products when not in use, for example.

Hanson (2013) concluded that *Environmental Concern* is a reasonable surrogate for green consumer attitudes and behaviors leading to buying more eco-friendly products as a behavioral indicator. In contrast, Syed Ali et al. (2012) found that there was nearly zero correlation between personal ecological awareness and attitude towards green purchasing. This implies that there is a possibility for respondents to answer in a contrary way to protect self-image. According to Fournier (2010), such

behavior is called 'Reaction Formation', a psychological pattern that defends an individual's social image by avoiding the truth; for example, saying one is concerned about the eco-system, but littering into water as a habit.

Hypothesis 3: *Environmental Concern and Habit* has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender* and *Age* as moderating factors.

Table 2.7 Review of discussed constructs for Environmental Concern and Habit

Dimension	Definition/Explanation	Measurement Item
Habit (Venkatesh et al, 2012)	The extent to which people tend to perform behaviors automatically because of learning or automaticity (Venkatesh et al., 2012).	The use of … has become a habit for me. I am addicted to using ... I must use ... Using … has become natural to me. (Venkatesh et al, 2012)
New Environmental Paradigm (Dunlap et al., 2000)	The belief about humanity's ability to upset the balance of nature, the existence of limits to growth for human societies and humanity's right to rule over the rest of nature (Dunlap et al., 2000).	[Reality of limits to growth] We are approaching the limit of the number of people the earth can support. The earth has plenty of natural resources if we just learn how to develop them. The earth has only limited room and resources. [Anti-anthropocentrism] Humans have a right to modify the natural environment to suit their needs. Humans were meant to rule over the rest of the nature. Plants and animals do not have equal rights as humans to exist.

Table 2.7 Review of discussed constructs for Environmental Concern and Habit (Cont.)

Dimension	Definition/ Explanation	Measurement Item
New Environmental Paradigm (Dunlap et al., 2000)	(Cont.)	[Fragility of nature's balance] When humans interfere with nature, it often produces disastrous consequences. The balance of nature is strong enough to cope with the impacts of modern industrial development. The balance of nature is very delicate and easily upset. [Rejection of exceptionalism] Human intelligence will ensure that we don't make the earth unlivable. Despite our special abilities, humans are still subject to the laws of nature. Humans will eventually learn enough about how nature works to be able to control it. [Possibility of an eco-crisis] Humans are severely abusing the environment. Human destruction of the environment has been greatly exaggerated. If things continue going as they presently are, we will soon experience a major ecological disaster. (Dunlap et al., 2000; Ogunbode, 2013)
Environmental Careless Habit	Automatic behaviors that have negative impact on the environment.	e.g., One time use of plastic bags, too much use of foam containers, littering.

Table 2.7 Review of discussed constructs for Environmental Concern and Habit (Cont.)

Dimension	Definition/Explanation	Measurement Item
Environmental Concern and Habit (This study) (Adapted from Dunlap et al., 2000)	The degree of belief to which careless behaviors and their negative impact on the environment.	I must reduce the use of plastic bags and foam boxes to reduce negative impact on the environment. Littering is damaging the eco-system and I must not litter. Nature is losing its balance and humans are facing more natural disasters because of large amount of electronic waste and pollution. I must use electricity and water with efficiency to save natural resources as much as I can for future generations. Global warming isn't a myth; humans have to take care of nature to slow the impending environmental crisis.

3) *Green Intention in Purchasing or Using IT Product*

Ajzen and Fishbein noted that attitude of an individual renders his/her intention to perform any behavior (Ajzen and Fishbein, 1980; Ajzen, 1991). In this study, *Green Intention in Purchasing or Using IT Product* is defined as the degree to which an individual plans to look for environmental friendliness of an IT product before purchase and use in the future. In the first UTAUT, Venkatesh et al. (2003) pointed out that a person will have an intention to use that product when product worthiness and influence from society are realized. In the UTAUT2, the *Behavioral Intention* still plays the same crucial role (Venkatesh et al., 2012). However, the *Behavioral Intention* would decay with the consumer's experience over time (Venkatesh et al., 2012). The consumer can be excited if he/she encounters an IT product that the consumer has no familiarity with. As time goes by, the degree of excitement on the same IT product, including an

intention to buy and use this IT product, will degrade with time (Bhattacherjee and Sanford, 2006; Petty et al., 1995).

In the IS Success theory, whenever the consumer realized that technology can fulfill his/her life satisfaction, the consumer will intent use it for better psychological well-being (DeLone and McLean, 1992; Techatassanasoontorn and Tanvisuth, 2010). Various benefits of technology could satisfy the consumer, generate better intention to use technology, and the more the consumer uses it is the better the individual satisfaction (DeLone and McLean, 2003) until his/her interest is depleted or the goal is reached. Satisfaction of the consumer is not just derived from benefits of the technology item and individual usage, but also from actions of the technology product/service provider and vice versa, particularly the green product. DeLone and McLean (2003) explained that higher *System Quality, Service Quality* and *Information Quality* translate into higher *User Satisfaction* and *Use* or *Intention to Use*. Within the context of the green IT product, the *Consumption Awareness* and *Social Influence* can lead to the green purchase and use of an IT product. An observation of the consumer intention to purchase green IT products can be easily done, but not for the usage of green IT product. As discussed earlier, the term 'green IT product' is abstract to many people. They might have no idea which of their IT products are green. This makes the frequency of use of green IT products impossible to measurement. People in countries like Thailand, have no idea what green IT product looks like, and are skeptical about environmental benefits. According to Chang and Cheng (2015), if consumers are skeptical, they could negatively respond to messages from the promotional exercise of businesses. For example, some advertising on TV is not believable in some skeptical consumers' opinion when the advertising claims are of questionable accuracy (Szykman et al., 1997).

Table 2.8 Details of discussed constructs for Green Intention in Purchasing or Using IT Product

Dimension	Definition/Explanation	Measurement Item
Behavioral Intention (Venkatesh et al., 2003; 2012)	The degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Venkatesh et al., 2003; 2012).	I intend to use … in the next <number> months I predict I would use … in the next <number> months I plan to use … in the next <number> months (Venkatesh et al., 2003) I intend to continue using … in the future I will always try to use … in my daily life I plan to continue to use … frequently (Venkatesh et al., 2012).
Intention to Use (DeLone and McLean, 2003)	A worthwhile alternative measure in some contexts. "Intention to use" is an attitude, whereas "use" is a behavior (DeLone and McLean, 2003).	N/A
Green Intention in Purchasing or Using IT Product (This study)	The degree to which an individual plans to look for environmental friendliness of an IT product before purchase and use in the future	I will look for an IT product (e.g., smartphone, tablet) that has eco-friendliness (e.g., energy saving) I will look for green indicators on an IT product label before I purchase. I will look for internationally environmental standards or awards of an IT product.

Instead of *Use*, DeLone and McLean (2003) explicated that *Intention to Use* may be an alternative measurement for some contexts when consumption behavior is difficult to measure by using the Liket scale as Schiffman et al. (2010, p. 96) suggested.

2.9.3 The Third Phase: Green Organizational Impact

Once consumers have positive attitude toward technology products that are eco-friendly, those consumers may have a positive attitude toward greenness of the firm as well. People try to look for environmental friendliness of businesses as well as in merchandise. DeLone and McLean (2003) replaced *Individual Impact* and *Organizational Impact* with *Net Benefit*, which is the balance of positive and negative impacts of a study subject on the system (e.g., consumers and a society, employees and an organization). Does consumer decision to buy and use eco-friendly IT products lead to consumer willingness to support eco-friendliness of the organization?

1) *Intention to Support Green Image Business*

Many researchers and practitioners believe that consumers have influence on survival of businesses, and in order to meet consumer demand and gain more benefit, the firm should be as flexible as possible. Consumer demand has an effect on the business model because the firm needs to maintain and improve its relationship with consumers, widen their distribution channel, and increase corporate value (Osterwalder et al., 2005). Porter (2004) stated, in his Five Competitive Forces, that no business can survive without consumers because they are one of the five significant elements of the firm (pp. 34-50). On the one hand, Freeman (2010) has renovated the classic typical stakeholder map, which displays that one of the important stakeholders is the consumer (pp. 1-30). Many literature writers (e.g., Porter, 2004; Pearlson and Saunders, 2006; Freeman, 2010; Kotler et al., 2012) agreed that consumers relate to business endurance. With this fact in mind, many businesses struggle to search for strategies to attract consumers. For example, some businesses invented ‘advergames’, the combination advertising and a video game, to draw the attention of Internet users which improved attitude toward the corporate image and lead to increased intention to purchase (Goh and Ping, 2014).

Distinct corporate attributes are necessary in order to create a positive image and reputation (Hawabhay et al., 2009; Hatch and Schultz, 2001). According to

Hawabhay et al. (2009), image and reputation differ, as follow: image of the firm is how the business is perceived by stakeholders but reputation is more fundamental (e.g., company projects, corporate behavior, communication) and is strengthened by a positive image; reputation is more important in decision making of stakeholders and it is not easy to reassemble broken reputation when it is based on trustworthiness and loyalty. Reputation is based on observer point of view on the firm over time and how the firm communicates to its stakeholders (Tucker and Melewar, 2005; Vidaver-Cohen, 2007). Still, whether reputation is more important than corporate image or not, both of them are linked to each other and grow together over time (Hawabhay et al., 2009). For example, reputation is an appraising corporate assessment, which emerging from stakeholder's awareness of the firm characteristics as corporate identities and accumulative stakeholders' impressions as corporate image (Barnett et al., 2006). In conclusion, the more favorable the corporate image/reputation, the easier it is for the corporation to achieve acceptance by consumers (Schiffman et al., 2010, p. 201; Jones, 2001, p. 151).

Corporate social responsibility (CSR) is the popular way to improve image and reputation of the firm (Zhou et al., 2012; Becker-Olsen et al., 2006; Pirsch et al., 2007; Pomering and Johnson, 2009; Brønn and Vrioni, 2001). Consumer's desire is external pressure to power the CSR (Lamberti and Lettieri, 2009; Vilke, 2011; Kotler et al., 2012; Khojastehpour and Johns, 2014; Sprinkle and Maines, 2010) and CSR will provide financial benefit to a company, more or less (Branco and Rodrigues, 2006; The Aspen Institute, 2008; Virakul et al., 2009; Taghian et al, 2015; Claydon, 2011). Green marketing (Schiffman et al., 2010, p. 526-529) and environmental protection (or policy) draw attention to consumers as CSR practices (Sprinkle and Maines, 2010; Vilke, 2011; Khojastehpour and Johns, 2014; Futrell, 2011, p. 74). Environmental responsibility of the firm, such as water efficiency in production (Lamboy, 2011) and energy conservation in use of IT (Kotler et al, 2012, p. 125), relates to corporate reputation (Husted and Allen, 2007) and intention to purchase by consumers (Knox and Maklan, 2004; Oberseder et al., 2013; Khojastehpour and Johns, 2014; Dawkins, 2004; Neville et al., 2005; Taghian et al, 2015). If a consumer has a good and strong participation with an organizational that has environmental protection policies, he/she will sense merit in

other green imaged organizations as well. According to Wu et al. (2011), businesses that have positive image can easily motivate consumers to purchase their products or services. Grimmer and Bingham (2013) pointed out that some consumers make purchase decisions because of social and environmental responsibility of businesses. It is a challenge for businesses not only to perform CSR but also to satisfy corporate stakeholders.

According to Kurkoon et al. (2018), CSR will be more efficient when it is driven by personal social responsibility (PSR) of most people of a firm, especially regarding the eco-system. The driving of CSR via PSR is displayed in figure 2.12.

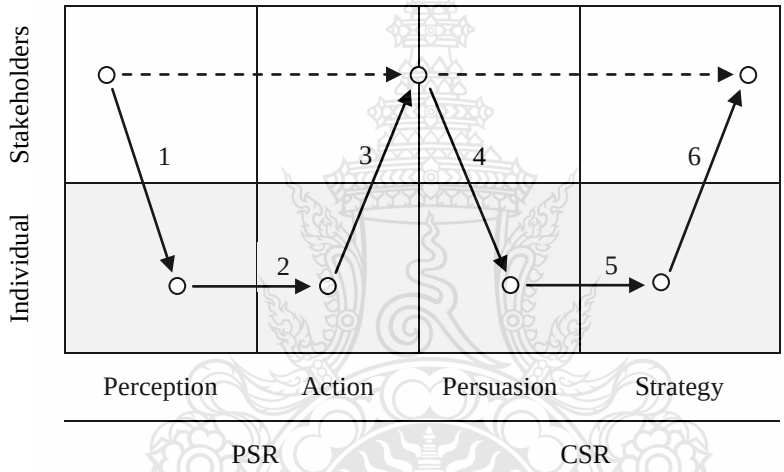


Figure 2.12 The W model of driving CSR via PSR (adapted from Coleman, 1986)

In figure 2.12, The number 1 is individual perception of negative impact on the environment, the 2 is he/she realized that good citizenship duties (PSR) is needed, the 3 is the person adopted/performed the good citizenship duties (e.g., 3R policy), the 4 to 6 are a consolidation of many PSRs to drive CSR (micro to macro) (Kurkoon et al., 2018).

Kotler et al. (2012) suggested that after CSR is launched, stakeholders will be skeptical of the corporation's motives, they will look for actions that fulfill on promises, they will want to know whether this is a long-term campaign or not, they will question about how it will make a real difference, they will want to know what the company used to do, and they will be waiting to see the results (p. 191). Advertising of environmental corporate responsibility may invoke skepticism and draw criticism from consumers,

who may not support the firm due to its lack of credibility (which is similar to Chang and Cheng, 2015). Unfortunately, many green products have a weak attraction in consumer eyes (Polonsky and Ottman, 1998; Wong et al., 1996 cited by Luzio and Lemke, 2013) because they not meet the consumer demand and behavior (Luzio and Lemke, 2013), and it getting worse when there is no environmental corporate image. Quality of the eco-friendly product contributes to the satisfaction and loyalty of the consumers, and this relationship will grow stronger if the firm has a greener brand image (Chang and Fong, 2010). When consumer satisfaction does not flow with the corporate movement, consumers might hesitate to purchase and go to another source. Thus, Consumers want to support businesses that have good image and which drives businesses to show more environmental responsibility (Seidel et al., 2013). This shows reputation that visible to the public, such as advertising of business environmental responsibility (Pickett-Baker and Ozaki, 2008; Juwaheer et al., 2012) or providing environmental knowledge for consumer (Shahzalal, 2013), means competitive advantage of business (Husted and Allen, 2007; Scharf et al., 2012), for example, increased corporate green product sales (Ziegler et al., 2011) among customers who are concerned about the environmental friendliness of the firm and its products.

Hypothesis 4: *Green Intention in Purchasing or Using IT Product* has a positive influence on *Intention to Supporting Green Imaged Business*

Table 2.9 Details of discussed constructs for Intention to Support Green Image Business

Dimension	Definition/Explanation	Measurement Item
Behavioral Intention (Venkatesh et al., 2003; 2012)	The degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Venkatesh et al., 2003; 2012).	I intend to use … in the next <number> months I predict I would use … in the next <number> months I plan to use … in the next <number> months (Venkatesh et al., 2003) I intend to continue using … in the future I will always try to use … in my daily life I plan to continue to use … frequently (Venkatesh et al., 2012).

Table 2.9 Details of discussed constructs for Intention to Support Green Image Business (Cont.)

Dimension	Definition/Explanation	Measurement Item
Intention to Use (DeLone and McLean, 2003)	A worthwhile alternative measure in some contexts. "Intention to use" is an attitude, whereas "use" is a behavior (DeLone and McLean, 2003).	N/A
Intention to Support Green Image Business (This study)	The degree to which an individual intends to purchase a product from businesses that have green images/reputation in the future.	I need to know more about environmental corporate image before I buy products of that business. Next time I buy some product, I should concern myself with the environmental responsibility of a company. Companies that promote their environmental responsibility will have more customers, which include me.

2) *Perceived Green Organizational Policy*

Previously in the section 2.7.2, 'Bridge between Individual Phase and Organizational Phase' (page 41-45), this study conceptualized the affiliation between an individual behavior and organizational impact with the concept of collective versus individual and S-shaped curve to interpret how a few people have impact on an organizational culture. The organizational culture is focused in this sector in order to carefully describe the shape of environmental topic within the organizational culture.

Dictionaries defines the term 'Organization' as a group of people who form a business together in order to achieve a particular aim and the term 'Culture' as the customs, beliefs, art, way of life and social organization of a particular group.

Therefore, the term ‘Organizational culture’ can be defined as “the set of shared values and norms that controls organizational members’ interactions with each other and with people outside the organization” (Jones, 2001, p. 130), which are essential for successful running of business (Swathi, 2014). Organizational culture may not aid the achievement of competitive advantage of the firm directly, but it helps improve organizational effectiveness (Smircich, 1983 cited by Jones, 2001, p. 130). This is because the organizational culture controls the way of thinking of personnel and the culture, therefore, affects an organization’s competitive position (Jones, 2001, p. 130), especially when it is perceived as a key resource that is created over time (Mintzberg, 1998, p. 274-278).

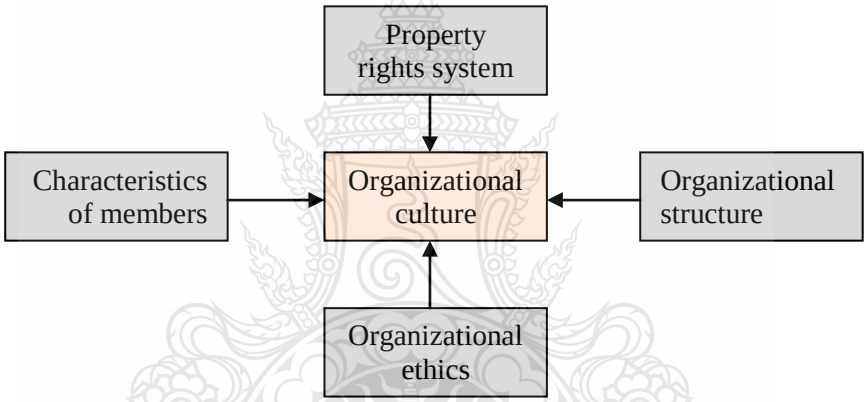


Figure 2.13 Organization’s Culture (Adapted from Jones, 2001, p. 138)

Figure 2.12 shows what factors shape an organizational culture. As employees are organizational stakeholders (Freeman, 2010, p. 10), their characteristics can tell the culture of a company. Jones (2001) explained that people who do not fit well with the culture will quit (p. 138) because they realize that there is no hope in gaining personal satisfaction (Kurkoon et al., 2014; Swathi, 2014). When most employees become assimilated, Jones (2001) wrote that the organizational value becomes more parochial, and the culture becomes more distinct from that of similar organizations (p. 139).

One of the components of the organizational culture is organizational ethics, which is defined as “the moral values, beliefs, and rules that establish the appropriate

way for organizational stakeholders to deal with one another and with the organization' environment" (Jones, 2001, p. 140). Shapira-Lishchinsky and Rosenblatt (2009) discovered that organizational ethics are predictors of absence from work. Some employees want work absence voluntarily, such as calling in sick to go to a movie. Negative attitude of employees toward their job is one of the reasons they withdraw from work while not quitting, employee dissatisfaction, for example (Sagie, 1998 cited by Shapira-Lishchinsky and Rosenblatt, 2009). Moreover, some employees leave their job because of the shame they feel in working for a company that has poor ethics, such as one that defrauds its customers (Kurkoon et al, 2014).

Property rights can be defined as "the rights that an organization gives to members to receive and use its resources" (Demsetz, 1967 cited by Jones, 2001, p. 143). Kurkoon et al. (2014) interviewed managers and employees, and found that some employees leave their job when they realize that they cannot protect or gain their property rights (some basic benefits that they should have, such as job security). The distribution of property rights has an effect on the organizational values that shape and motivate employees (Jones, 1983 cited by Jones, 2001, p. 144). The distribution of property rights can show the emergence of culture and effectiveness of a system.

According to the figure 2.12, the last jigsaw of the organizational culture is organizational structure. The organizational structure is a firm's formal system of configuration, procedures, governance mechanisms, decision-making processes and so forth (Hitt et al., 2001, p. 444) that an organization establishes to control its activities (Jones, 2001, p. 147). Structure of an organization can promote values of the culture that foster integration and coordination. A good structure helps improve overall firm performance, reduces research and development time and increases organizational flexibility (p. 148). Changing the structure means changing the culture of the firm as well. To summarize, the organizational culture is made of the four psychological materials: characteristics of personnel, ethics of a system, distribution of property rights, and structure of a system. All the four materials are always generated by an individual, which means to reiterate the conclusion of section 2.7.2 that states that individual behavior and organizational impact are associated.

Organizational culture can be similar, different or very different even in the same industry. Jones (2001) determined this case study below:

> "*Coca-Cola takes pride in its long-term commitment to employees; its loyal managers, many of whom spend their entire careers with the organization; and its cautious and cooperative approach to planning. By contrast, PepsiCo has a highly political and competitive culture in which conflicts over decision making cause frequent turnover among top managers.*" (p. 9)

Therefore, nobody could guarantee that the organizational culture of all businesses within the same industry have to be the same. It depends on how managers furnish their organization. Nevertheless, environmental policies in organizational cultures among businesses who desire to win environmental reputation could be similar, even they are in the different industries.

A sustainability report aims at public disclosure of information about the non-financial performance of an organization and is an important mechanism to improve moral transparency of an organization (UNDESA, 2015b). This study gathers data from sustainability reports from many organizations for comparison purposes. From random data collection with an online search engine (searched key words were 'Sustainability report'), this study analyzed sustainability reports from 83 international and domestic businesses (references are available in the appendix). Various key words (shown in parentheses of each topic) were used to seek environmental topics. Although they are in different industries, their environmental policies and goals are very similar to each other. Popular environmental topics in the 83 sustainability reports are as follow:

(1) Air quality management (searched key word: CO2, GHG, Carbon) – the ways to reduce air pollution, such as GHGs, VOCs (Volatile Organic Compound), CO_2 and CO, or how low their carbon footprints are. Many businesses reported that they have success in the reduction of air pollution emission with comparison charts, while others reported that they are working on it and show how much air pollution they annually release. Admirably, all 83 businesses indicated that they understand the negative impact of air pollution.

(2) Water usage management (searched key word: Water, Water consumption, Water management, Efficiency) – all 83 businesses pointed out that water is sharable natural resource and they have to use it wisely and efficiently. More than half of the 83 businesses use a water footprint as a measurement tool. Two from the 83 annual reports have no clear mention of corporate water usage. However, the fact that they did not mention it does not necessarily mean that they do not care about water conservation.

(3) Reforestation (searched key words: Reforestation, Forest, Forestry, Tree, Planting, Planted, Plant) – forests are another natural resource that businesses have to share with others and use cautiously. Nevertheless, not all businesses use trees in their production, which makes reforestation become a less critical topic in their annual reports. From the 83 reports, 50 businesses vividly published their nature restoration campaigns and some of them have pictures as evidences.

(4) Waste management (searched key word: Waste management, Waste reduce, Waste, Landfill) – reducing air pollution emissions and water usage are factors to win environment awards, but reducing waste disposal is significant as well. Waste, especially e-waste, can cause environmental contamination when it is tossed in a landfill or disposed of by other improper methods, such as low temperature incineration. Two of the 83 businesses did not mention waste management performance, explicitly, but this may not mean they ignore waste management.

(5) Recycling (searched key words: Recycle, Recycling, Reuse) – as explained, waste is toxic to the environment, wildlife and human. Businesses cannot operate without generating waste, but at least they can turn some of waste into raw materials for the next production process. 3R policies (Recycle, Reuse and Reduce) are better than recycling alone. Three of the 83 annual reports did not clearly discuss their recycling performance.

(6) Energy management (searched key words: Energy management, Energy consumption, Energy efficiency, Energy) – All the 83 businesses were concerned with their energy usage and preferred renewable energy sources. This implies the great influence of energy-saving awards, which are a good sign to all corporate and social stakeholders. Businesses realized that using electricity equals emitting heat and GHGs.

Businesses, therefore, have to use energy wisely, just as water, wood and other natural resources.

There are six environmental topics that are defaults in publishing the annual sustainability report. They are also defaults in ordinary environmental policies of organizational culture of green-imaged businesses. To summarize, air pollution (GHGs, VOCs, CO_2 and so on) and waste reduction, water and energy efficiency, recycling, and reforestation are important to image/reputation of the firm. This study will measure the level of an individual perception of the environmental policies with these six environmental topics. The numerical result will be an indicator for categorization between respondents who participate with green-imaged organization and respondents who do not. The numerical result will also be used to calculate correlation to behavior intentions as well.

In the broad sense of acceptance model, one of the important factors that persuade an individual to perform a behavior is a belief that a behavior and its consequences are acceptable in the social sphere (Ajzen and Fishbein, 1980; Ajzen, 1991; Venkatesh et al., 2003; Venkatesh et al., 2012). Taylor and Todd (1995b) ascertained that society can be broken-down into two tiers: Superior (higher than an individual) and Peer (equal to or lower than an individual). This study determined that an organization and its culture and policies are in the superior level. All members of an organization have to follow its culture if they want to be parts of the organization (Jones, 2001, p. 138). This means an organizational culture has influence on an individual behavioral intention. There are two behavioral intentions in this study, which are *Green Intention in Purchasing or Using IT Product* and *Supporting Green Imaged Business*. In case a respondent answers that he/she does not know or is not sure that his/her organization has the six environmental policies in the culture, this study considers that person as a consumer who has no involvement with a green-imaged organization.

Hypothesis 5: *Perceived Green Organizational Policy* has positive influences on *Green Intention in Purchasing or Using IT Product* and *Intention to Supporting Green Imaged Business*.

Table 2.10 Review of discussed constructs for Perceived Green Organizational Policy

Dimension	Definition/Explanation	Measurement Item
Perceived Green Organizational Policy (This study)	The degree to which an individual recognizes way of thinking, policies, strategies and the like of an organization he/she is relate to, especially environmental topics.	Does an organization/institution that you participate with have these six environmental policies: [1 = No/2 = Not sure/3 = Yes] • Air pollution emission reduction • Water usage efficiency • Reforestation or wildlife restoration • Waste management • Recycle and reuse • Electricity usage efficiency

2.9 Chapter Conclusion

This study broadly discussed what are the information system and technology, green IT, benefits of eco-friendliness, environmental standards and indicators, and a historical explanation of background theories (TRA, TPB, TAMs, UTAUTs, DOI and HBM). Then, this study deeply scrutinized the method of model development, which is phase separation of the framework, bridging an individual to an organization, constructs and their origin and potential relationship with the others construct.

In the phase separation discussion, this study referenced communication theories and information system success models as the basis to break down the framework into three phases, as follow: Green IT Introduction (interaction between green IT product, a society and an individual), Green Individual Acceptance (psychological mechanism of an individual) and Green Organizational Impact (linkage between an individual and an organization). There are eight constructs in the study framework, which are *Perceived Green Benefit* (consumer's perception of eco-friendly benefits of IT products), *Resource Sacrifice* (willingness to spend extra money, time and accept reduced specifications for conservation), *Noticeability* (knowledge and capability to identify eco-friendly product), *Social Influence* (impact from society to an

individual's decision), *Environmental Concern & Habit* (appropriateness of individual's behaviors and impact on the earth), *Green Intention in Purchasing or Using IT Product* (environmental willingness to buy or use IT products), *Intention to Supporting Green Imaged Business* (preferring products from eco-friendly corporation) and *Perceived Green Organizational Policy* (perception of environmental policies in one's workplace).

According to the five hypotheses, there are six independent variables (*Perceived Green Benefit*, *Resource Sacrifice*, *Noticeability*, *Social Influence*, *Environmental Concern & Habit* and *Perceived Green Organizational Policy*), one mediator (*Green Intention in Purchasing or Using IT Product*), one dependent variable (*Intention to Supporting Green Imaged Business*) and three moderating factors (*Age, Gender, Educational experience*). All eight variables and their potential relationships are present in the statistic research model, as show in Figure 2.13, and it will be used for Structural Equation Model analysis.

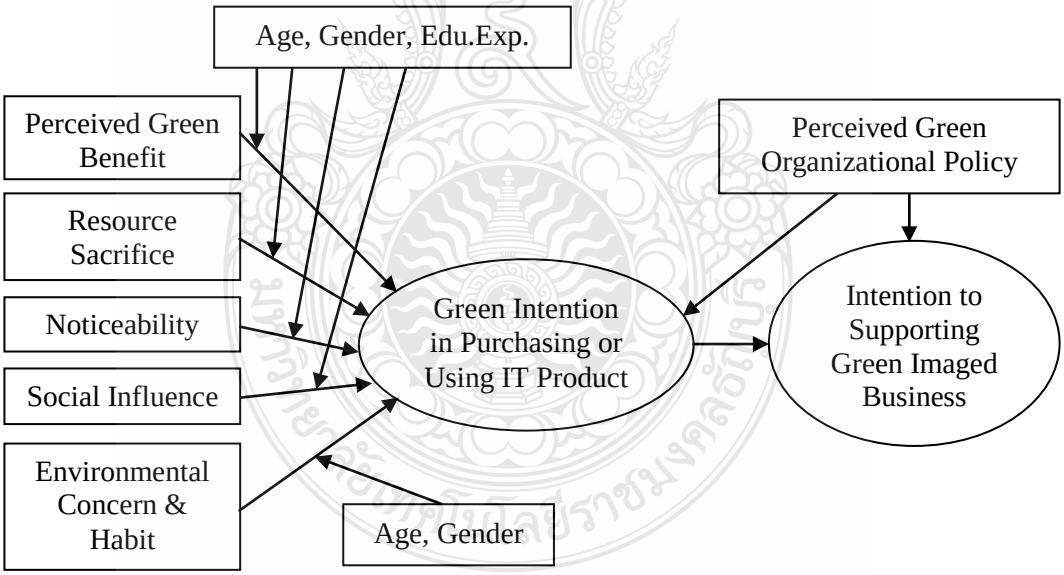


Figure 2.14 The Statistical Research Framework

CHAPTER 3
RESEARCH METHODOLOGY

Structure of this chapter

This section discusses the methodology behind this study, such as validation, translation process, data collection, and statistical tools. This section is composed of nine topics, as follows:

3.1 Research Design
3.2 Population and Sampling
3.3 Data Gathering
3.4 Research Instrumentation
3.5 Missing Data Handling
3.6 Result Methodology
3.7 Validity and Reliability
3.8 Response Rate
3.9 Structural Equation Modeling (SEM)

3.1 Research Design

This study is cross-sectional meaning it is an observation into population and restricted to a single point of time. Quantitative research is employed in this study for collecting data by using an online questionnaire as the primary instrument and a printed questionnaire as the secondary. The numerical result from this survey is drawn from the implementation of specific elements (which are *Perceived Green Benefit, Resource Sacrifice, Noticeability, Social Influence, Environmental Concern and Habit, Green Intention in Purchasing or Using IT Product, Intention to Supporting Green Imaged Business* and *Perceived Green Organizational Policy*) in the research framework.

This study used the quantitative research method to observe consumers' perspectives about green IT adoption, utilization, and its impact on businesses.

3.2 Population and Sampling

First of all, the setting of this study is Thailand. The population of this study is a group of consumers who are consumers in Thailand, with ages between 15 and 60 (working age), and not limited by gender, occupation, and educational background. National statistical office (NSO) and ministry of information and communication technology (MICT) of Thailand (2011) reported that average working age of Thai people starts from 15 and when 60, retire. Most people who are younger than 15 and older than 60 have little or no influence on the workplace, which means the relationship between them and an organizational culture or policy is miniscule. However, some employees, notably those under 20, may lack maturity and a sense of responsibility, requiring more time to garner experience in the workplace. There is no established time frame for 'how long it takes for an employee to become familiar with the way of thinking of an organization'. It depends on an individual's maturity. Generally speaking, an 18-year-old person is recognized as an adult. Conversely, "longitudinal neuroimaging studies (e.g., Rubia et al., 2000; Sowell et al., 2003), demonstrated that the adolescent brain continues to mature well into the 20s" (Johnson et al., 2009). Accordingly, this study selected respondents who were between 20 and 60.

This study used Yamane (1967) to calculate a suitable sample size with a 95% confidence level.

$$n = \left[\frac{N}{1 + Ne^2} \right] \tag{3.1}$$

By n = the sample size, N = the population, and e = allowable error value

Yamane (1967) pointed out that if there is a huge number (or uncountable) population, the suitable amount for a study sample should be 400. As previously discussed in the description of *Perceived Green Organizational Policy*, this research uses the numerical result from this variable to be a separating indication between two different groups of consumers. The individual's perception of environmentally friendly policies could be divided into three degrees; 3 = Yes, 2 = Not sure, and 1 = No. A responder, who has average score lower than 2, will be counted as an employee who

does not work in or participate with an organization that has environmentally friendly policies (or a general consumer).

3.3 Data Gathering

Mixed-mode survey, which uses both an online and printed questionnaire, will be used when an online survey is unsuitable. About mixed-mode surveys, Meckel et al. (2005) accepted that it helps increase the response rate of surveys and reduce the level of non-response bias to some degree (Griffin et al., 2001, p. 5 cited by Meckel et al. 2005). Thus, a mixed-mode survey can be a good tool for research (Meckel et al., 2005) and that is why this study has reserved it should its use become necessary.

As discussed, the study sample is huge because this study focused on Thai employees who are working in companies that are involved in various categories, at the same time, they are Thai consumers. They could have different points of view regarding the environment for various categories of industry. Yamane (1967) specified that if a study population is 500,000 or more, 400 people are fit for 5 percent of allowable error value.

3.4 Research Instrumentation

This research utilized a questionnaire as a tool to collect data. The questionnaire is separated into:

1) Demographic data: Gender, Age, Educational Background, Average Income and Business Category.

2) Predictor variables in the Green IT Introduction phase: *Perceived Green Benefit*, *Resource Sacrifice*, *Noticeability* and *Social Influence*.

3) Predictor variables in the Green Individual Acceptance phase: *Environmental Concern and Habit* and *Green Intention in Purchasing or Using IT Product*.

4) Predictor variables in Green Organizational Impact phase: *Intention to Supporting Green Imaged Business* and *Perceived Green Organizational Policy.*

5) Optional section: an opened-end question will help this study to acquire perceptions from different points of view (Jackson, 2009, pp.86-87; Neuman, 2011, pp.174-175).

The Likert Scale was developed by Rensis Likert in 1932. This research employs the five-point Likert scale due to its less intricate nature, rather than the seven-point scale and the nine-point scale. In other words, it is easy to be understood. For example, many participants do not understand the difference between “Strongly agree” and “Extremely agree” (or “Absolutely agree”), which consequently led to misunderstanding. The end-points of a Likert scale are “Strongly disagree = 1” and “Strongly agree = 5.” However, the scale can be seen as levels of importance as well (Not at all important = 1 and Very important = 5). The data are typically treated as interval scale.

3.5 Missing Data Handling

Naturally, some respondents do not like to answer questionnaires, whether long or short. For example, some respondents leave some answers blank. Modern statistical analysis applications have become more advanced than in foregone years. For example, Karanja et al. (2010) reviewed that IBM-SPSS (Statistical Package for the Social Sciences), also known as PASW (Predictive Analytics SoftWare), has the ability to eliminate missing data in survey-based research by replacing blank value using various techniques (e.g., series mean, median of nearby points, linear interpolation, linear trend, etc.) among other values.

Pairwise Deletion (PD) and Listwise Deletion (LD) are traditional methods to confront the missing data. Both PD and LD will eliminate missing items when those items are MCAR (Missing Completely at Random) and is less than 10 percent. Pros are as already discussed, but cons require a larger sample size, causing lower statistical utility, yielding biased parameters, leading to huge loss of data, reducing accuracy and so on. Karanja et al. (2010) recommended that researchers should avoid both the PD and the LD in the first generation. Even though the second and the third missing data treatment techniques have better capability, far beyond comparisons with the traditional generation, they still have weak points and loopholes. In light of this fact, using

statistical technique means accepting unavoidable error, thus this study prefers very conventional methodology; compiling data from incomplete questionnaires is not an option in this study.

3.6 Result Methodology

This research used descriptive statistics, which are mean ($\bar{x}$), frequency (f), percentage (%), and standard deviation (SD), to describe the characteristics of demographic of respondents after analysis of the data (Severin and Tankard, 2010, p. 41; Jackson, 2009, p. 109). Descriptive statistic is a general type of statistic used by most researchers to explain patterns in the data (Neuman, 2011, p. 386). Likewise, Vanichbuncha (2011) explained that descriptive statistic is useful to summarize characteristics of data (p. 43). Descriptive statistic utilized to measure respondents' views by comparing with the scale as Sinjaru (2014, p.75) suggested. Additionally discussing, this levels of agreement can be considered as levels of importance. It is very useful to a statistical interpretation.

1.00 – 1.80 = Strongly disagree
1.81 – 2.60 = Disagree
2.61 – 3.40 = Neutral
3.41 – 4.20 = Agree
4.21 – 5.00 = Strongly agree

The scale calculated from: $\frac{N-1}{N} = \frac{5-1}{5} = 1.80$ (3.2)

3.7 Validity and Reliability

3.7.1 Content Validity Testing

Content analysis is a systematic method of analyzing message content: a test with content validity has items that satisfactorily assess the content being examined (Severin and Tankard, 2010, p. 35; Jackson, 2009, p. 70; Neuman, 2011, pp. 212-213). To test that the questionnaire's ability to cover the assertions of the theory, the content

validity test with the index of item objective congruence (IOC) method was used. The questionnaire was assessed by five experts, who are in the information system field, the business field, and others. The IOC value is calculated from the following equation:

$$IOC = \left[\frac{\Sigma R}{N} \right] \tag{3.3}$$

By IOC = Index of item Objective Congruence, ΣR = summation of score, and N = number of expert.

An acceptable value of IOC is 0.5 or more. In case of IOC value is lower than 0.5, the questionnaire item need to be modified.

3.7.2 Result of Content Validity

The questionnaire was tested in terms of content validity before data collection. There were five experts in the content validity testing. The testing of index of item-object congruence (IOC) is essential to prove readiness and fitness of the questionnaire regarding theoretical appropriateness. The result of the IOC testing was approximately 0.841. Although 0.841 is acceptable, some questionnaire items had to be edited. Accordingly, some questionnaire items are modified as suggested by the five experts (more information can be found in appendix C; page 270).

3.7.3 Reliability Testing

Reliability means dependability or consistency (Neuman, 2011, p. 208; Severin and Tankard, 2010, p. 42; Jackson, 2009, p. 65). In other words, testing a survey instrument if repeated should have the same (or almost the same) result. This questionnaire was sent to 30 respondents in a pilot-test (also known as pre-test) for measuring reliability. This study used Cronbach's alpha coefficient (α) examined reliability of the questionnaire. The reason why this study used Cronbach's alpha coefficient is it suitable for a survey instrument that uses scale, especially the Likert scale (Vanichbuncha, 2011, pp. 34-35).

The formula of the coefficient α is:

$$\alpha = \frac{k}{k-1}\left[1 - \frac{\Sigma S_i^{\,2}}{S_t^{\,2}}\right] \tag{3.4}$$

When α = reliability, k = number of question, S_i^2 = divergence of each question, and S_t^2 = divergence of all questions.

Acceptable reliability value in this study is more than 0.7. A question that has scored lower than 0.7 will be removed.

Many researchers borrowed constructs and questionnaire items that have already been scrutinized in a reliability test. For example, Pahnila et al. (2011) explained that they used items which have been tried and tested in previous studies. Therefore, it is not necessary to ascertain reliability in their measurement items again. On the other hand, Bandyopadhyay and Fraccastoro (2007) brought constructs from UTAUT model, which are *Performance Expectancy*, *Effort Expectancy*, *Social Influence*, and *Behavioral Intention*, to apply in their study. The study tested questionnaire items once again because the study subject was changed. Likewise, this research employed constructs from various theories and changed the study subject to the green IT product. Thus, it is very important to test reliability in this researcher's questionnaire items.

3.7.4 Result of Reliability Testing (Pre-testing)

The online questionnaires were randomly distributed via online communities, such as social networks and forums. The first thirty of received questionnaires were scrutinized using Cronbach's alpha to check overall reliability. The test results of each question set are shown on table 3.1.

Adjusting to statistical results, all questions of *Noticeability* and *Perceived Green Organizational* were suggested to be removed before the reliability test because they are not five-point Likert scale questions, unlike the other items. After removing the *Noticeability* and *Perceived Green Organizational* items, the Cronbach's alpha score leapt from .970 to .978, which is exceedingly close to 1, the strongest number (Jackson,

2009, p. 67). With review of the Cronbach's alpha result, the questionnaire is appropriate and reliable.

Table 3.1 Cronbach's alpha score

Factor/Question set	Abbr.	Scale	Item	α
Perceived Green Benefit	PGB	5-pt Likert	4	.910
Resource Sacrifice	RS	5-pt Likert	3	.833
Noticeability	NA	2-pt	6	.503
Social Influence	SI	5-pt Likert	3	.883
Environmental Concern & Habit	ECH	5-pt Likert	5	.948
Green Intention in Purchasing/Using IT Product	GIP	5-pt Likert	3	.930
Intention to Support Green Imaged Business	ISG	5-pt Likert	3	.924
Perceived Green Organizational Policy	PGP	3-pt	6	.772
Overall (without Noticeability and Perceived Green Organizational Policy)				**.978**

3.7.5 Convergent and Discriminate Validity Testing

The purpose of construct validity testing is to make sure that the questionnaire better covers the assertions of the theory. Discriminate validity testing is one of the subtypes of construct validity. It tests whether measurements or concepts that are supposed to be unrelated are in reality unrelated. The purpose of discriminate validity testing is to assess correlation among latent variables to affirm that they are good representations and do not correlate with others (Neuman, 2011, pp. 214; Jackson, 2009, p. 71). Statistical applications, such as SPSS (for Windows) and LISREL, can provide help for validity testing of constructs convergence and discrimination by a factor analysis. If questionnaire items are convergent valid, they should fall into their component group not other groups in a pattern matrix and individual average loading values should be higher than the extracted value of its variant. This study employed CFA (Confirm Factor Analysis) as the extraction method for factor analysis. Whenever the variance of an extracted value among dimensions within a single linear regression equation is greater than a correlation square value, discriminate validity is established.

As Vanichbuncha (2011) suggested, CFA Confirmatory Factor Analysis is compatible with a study when

(i) The researcher already knows how factors should be categorized,

(ii) Those factors were categorized in previous study, and

(iii) An equation of relationship exists in a study (p. 235).

All three regulations are positively matched for this research. The tests of convergence and discrimination contain statistical analyses, which are available in the next chapter.

3.8 Response Rate

As earlier discussed, this study used online questionnaires and printed questionnaires to ensure that 400 responses would be the minimum. Initiated on the 26th of June 2016, the return rate was 648 by the 10th of October 2016. Subtracting the first 30 in a pilot-test, 618 was the return rate. There were 334 printed questionnaires and 284 online questionnaires. All incomplete questionnaires were removed. Only 70 respondents wrote comments in the optional section. Demographic data is shown in table 3.2 to 3.5.

Table 3.2 Response rate categorized by gender

Gender	**Amount (Person/people)**	**Percent**
Male	298	48.2
Female	320	51.8
Total	**618**	**100.0**

Table 3.3 Response rate categorized by age

Age	Amount (Person/people)	Percent
Under 20	61	9.9
20-30	266	43.0
31-40	147	23.8
41-50	95	15.4
Over 50	49	7.9
Total	**618**	**100.0**

Table 3.4 Response rate categorized by educational background

Educational background	Amount (Person/people)	Percent
Under bachelor's degree/high vocational certificate	137	22.2
Bachelor's degree/high vocational certificate	355	57.4
Master's degree	112	18.1
Above master's degree	14	2.3
Total	**618**	**100.0**

Table 3.5 Response rate categorized by average salary

Average salary (THB)	Amount (Person/people)	Percent
Less than 20,000	283	45.8
20,000 – 30,000	149	24.1
30,001 – 40,000	81	13.1
40,001 – 50,000	52	8.4
Higher than 50,000	53	8.6
Total	**618**	**100.0**

THB = Thai Baht

3.9 Structural Equation Modeling (SEM)

In the past, Chin (1998) suggested that SEM techniques, which is a second-generation data analysis technique, was use many times in the IS field due to its advantages over first-generation techniques (e.g., principal components analysis, factor analysis, discriminant analysis, etc.). Later, Gefen *et al.* (2000) indicated that the SEM technique can analyze data with standard of high quality statistical analysis, but the SEM technique would represent state-of-the-art in a study when it is compatible with the main purpose and objective. Sinjaru (2014) wrote that SEM technique would help study to fulfill completeness in a study model because it is a combination of two important statistic methods that are path analysis (structural model) and factor analysis (EFA, CFA, measurement model) (p. 523). Vanichbuncha (2013) pointed out that the SEM technique is widely used in many fields (p. 76). Furthermore, previous studies that this study cited to, such as Venkstesh *et al.* (2003) and Venkstesh *et al.* (2012), used the SEM technique. In this regard, this study employed the SEM technique due to its benefits. Steps of the SEM analyze are arranged as follows:

1. Test variables in this study: Reliability testing, Convergent validity testing, and Discriminant validity testing
2. Establishing the structural model.
3. Defining all latent and observe variables to structural model.
4. Analyzing the structural model, and calculating regression weight.
5. Measuring model fit.

Fit values for the study model are showing in table 3.6. In case some model fitness indexes do not fall into acceptable value ranges, they need to be verified.

Table 3.6 Model fit and acceptable value

Fit Index (Abbrev./Symbol)	Fit Value	Reference
Chi-Square, χ^2-test (CMIN, CMIN-ρ, χ^2)	Acceptable: p-value > 0.50 (also depends on sample size)	Angsuchoti et al. (2011, p. 29); Barrett (2007); Diamantopoulos and Siguaw (2000, p. 83); Santibánez-Andrade et al. (2015); Sinjaru (2014, p. 555); Vanichbuncha (2013, p. 109)
Chi-Square/ Degree of Freedom (CMIN/DF, χ^2/DF)	Best: ≤ 2.00 Good: ≤ 3.00 Acceptable: ≤ 5.00	Angsuchoti et al. (2011, p. 29); Diamantopoulos and Siguaw (2000, p. 98); Kaiyawan (2013, p. 159); Khedhaouria et al. (2013); Sinjaru (2014, p. 555); Ullman (2001); Vanichbuncha (2013, p. 110)
Standardized Root Mean square Residual (RMR, SRMR)	Best: ≤ 0.04 Good: ≤ 0.05 Acceptable: ≤ 0.08	Angsuchoti et al. (2011, p. 30); Diamantopoulos and Siguaw (2000, p. 88); Kaiyawan (2013, p. 161); Schumacker and Lomax (2010, p. 87); Vanichbuncha (2013, p. 111)
Root Mean Square Error of Approximation (RMSEA)	Maximum: = 0.00 Good: ≤ 0.05 Acceptable: ≤ 0.08	Angsuchoti et al. (2011, p. 29); Diamantopoulos and Siguaw (2000, p. 85); Kaiyawan (2013, p. 161); Khedhaouria et al. (2013); Santibánez-Andrade et al. (2015); Sinjaru (2014, p. 555); Vanichbuncha (2013, p. 116)

Table 3.6 Model fit and acceptable value (Cont.)

Fit Index (Abbrev./Symbol)	Fit Value	Reference
The Bentler-Bonett's Normed Fit Index (NFI)	Maximum: = 1.00 Best: ≥ 0.98 Good: ≥ 0.95 Acceptable: ≥ 0.90	Angsuchoti et al. (2011, p. 28); Diamantopoulos and Siguaw (2000, p. 88); Kaiyawan (2013, p. 161); Santibánez-Andrade et al. (2015); Schumacker and Lomax (2010, p. 89); Vanichbuncha (2013, p. 112)
Comparative Fit Index of Bentler (CFI)	Maximum: = 1.00 Best: ≥ 0.97 Better: ≥ 0.95 Good: ≥ 0.92 Acceptable: ≥ 0.90	Angsuchoti et al. (2011, p. 29); Kaiyawan (2013, p. 161); Khedhaouria et al. (2013); Diamantopoulos and Siguaw (2000, p. 88); Santibánez-Andrade et al. (2015); Vanichbuncha (2013, p. 114)
Goodness of Fit Index (GoF, GFI)	Maximum: = 1.00 Best: > 0.97 Good: > 0.95 Acceptable: ≥ 0.90	Angsuchoti et al. (2011, p. 29); Diamantopoulos and Siguaw (2000, p. 87); Kaiyawan (2013, p. 161); Khedhaouria et al. (2013); Schumacker and Lomax (2010, p. 86); Sinjaru (2014, p. 555); Vanichbuncha (2013, p. 112)
The Bentler-Bonett's Normed Fit Index (NFI)	Maximum: = 1.00 Best: ≥ 0.98 Good: ≥ 0.95 Acceptable: ≥ 0.90	Angsuchoti et al. (2011, p. 28); Diamantopoulos and Siguaw (2000, p. 88); Kaiyawan (2013, p. 161); Santibánez-Andrade et al. (2015); Schumacker and Lomax (2010, p. 89); Vanichbuncha (2013, p. 112)

Table 3.6 Model fit and acceptable value (Cont.)

Fit Index (Abbrev./Symbol)	Fit Value	Reference
Hoelter's critical N (HOELTER, CN)	Acceptable: ≥ 200	Angsuchoti et al. (2011, p. 28); Diamantopoulos and Siguaw (2000, p. 88); Vanichbuncha (2013, p. 117)
Q-Plot *for LISREL	Acceptable: > 1.00 (Slope: ≈45 degree)	Angsuchoti et al. (2011, p. 28); Jöreskog and Sörbom (1996, pp. 110-111)
Significant Level of Regression Weight	< 0.05, p = *	

CHAPTER 4

RESEARCH RESULT

Structure of this chapter

This chapter presents statistical results of the model. This section is composed of six major subjects, as follows:

4.1 Descriptive statistic

4.2 Structural Equation Model

4.3 Hypothesis judgment

4.4 Qualitative analysis

4.5 Construct Finding Conclusion

4.1 Descriptive Statistic

In this section, statistical results of the factors are extrapolated. In the upcoming table, descriptive statistical results of the factors are exhibited, such as frequency of scales' choices (e.g., strongly disagree - strongly agree), average ($\bar{x}$), standard deviation (S.D.), and ranking of factors.

4.1.1 Green IT Introduction phase

There are two sections in the first phase; Consumption Awareness and Social Awareness. Consumption Awareness is composed of three factors, which are *Perceived Green Benefit* (PGB), *Resource Sacrifice* (RS), and *Noticeability* (NA). Social Awareness has only one surrogate that is *Social Influence* (SI). Because of dissimilarity between factors, *Noticeability* that uses two-point scale (Do not know/Know) is converted to a five-point scale. The conversion formula is showed as equation 4.1 and equation 4.2 is an example.

$$NV = Round\left(\frac{ns(cs)}{ob}\right) \tag{4.1}$$

Where *NV* = New value, ns = New scale, *cs* = Current score, *ob* = Number of observed variable, and *Round* = round half towards positive infinity.

$$NV = Round\left(\frac{5(\sum NA)}{6}\right) \quad (4.2)$$

Table 4.1 Descriptive statistic result of Green IT Introduction phase

Factor	Level of significant (Average)					x̄	S.D.	Rank
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
PGB	3 (0.5%)	35 (6.1%)	77 (12.5%)	278 (45.0%)	225 (36.4%)	4.112	.8647	1
RS	9 (1.5%)	31 (5.0%)	132 (21.4%)	301 (48.7%)	145 (23.5%)	3.877	.8752	3
NA	0	0	175 (28.3%)	308 (49.8%)	135 (21.8%)	3.935	.7059	2
Overall–Consumption Awareness	12 (0.6%)	66 (3.6%)	384 (20.7%)	887 (47.8%)	505 (27.2%)	3.975	.8153	
SI	41 (6.6%)	72 (11.7%)	195 (31.6)	239 (38.7%)	71 (11.5%)	3.367	1.0464	4
Overall	**53 (2.1%)**	**138 (5.6%)**	**579 (23.4%)**	**1126 (45.6%)**	**576 (23.3%)**	**3.823**	**.8731**	

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, NA = Noticeability

In the first phase, *Perceived Green Benefit* (PGB) is the most important indicator of consumers' environmental awareness ($\bar{x}$ = 4.112; S.D. = .8647), followed by *Noticeability* (NA) ($\bar{x}$ = 3.935; S.D. = .7059), *Resource Sacrifice* (RS) ($\bar{x}$ = 3.877; S.D. = .8752), and *Social Influence* (SI) ($\bar{x}$ = 3.367; S.D. = 1.0464). The overall score of the phase is $\bar{x}$ = 3.823 with S.D. = .8731.

This indirectly explains the consumers' preferences. They know that environmental friendliness is important, but many of them do not know green indicators

meanings. However, many consumers will frown at environmental friendliness if it means additional price. Although a society has influence on decision making in respect to eco-friendliness, it is as important at the individual level.

4.1.2 Green Individual Acceptance phase

There are two constituents in the second phase, which are *Environmental Concern & Habit* (ECH) and *Green Intention in Purchasing or Using IT Product* (GIP). Both utilized the five-point Likert scale in their measurements. Table 4.2 shows descriptive statistical results of the two elements.

Table 4.2 Descriptive statistic result of Green Individual Acceptance phase

Factor	Level of significant (Average)					x̄	S.D.	Rank
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
ECH	2 (0.3%)	12 (1.9%)	36 (5.8%)	173 (28.0%)	395 (63.9%)	4.532	.7222	1
GIP	9 (1.5%)	16 (2.6%)	57 (9.3%)	253 (40.9%)	283 (45.8%)	4.270	.8443	2
Overall	**11 (0.9%)**	**28 (2.3%)**	**93 (7.5%)**	**426 (34.5%)**	**678 (57.9%)**	**4.401**	**.7833**	

ECH = Environmental Concern & Habit, PGP = Perceived Green Organizational Policy

As indicated in table 4.2, *Environmental Concern & Habit* (ECH) ($\bar{x}$ = 4.532; S.D. = .7222) barely outweighs *Green Intention in Purchasing or Using IT Product* (GIP) ($\bar{x}$ = 4.270; S.D. = .8443). The overall score is $\bar{x}$ = 4.401 with S.D. = .7833.

Besides Consumption Awareness and the Social Awareness, *Environmental Concern & Habit* also motivates consumers to go green. If people understand how crucial environmental protection is juxtaposed (placed close together for comparison) with the severity of the environmental problem, they will change their behavior (refraining from littering and using electricity more efficiently, for example). With the

positive influence of Consumption Awareness and the Social Awareness, there is likelihood of intention to purchase/use IT products that meet the standards of environmental friendliness.

4.1.3 Green Organizational Impact phase

The third phase contains two components: *Perceived Green Organizational Policy* (PGP) and *Intention to Support Green Imaged Business* (ISG). *Intention to Support Green Imaged Business* incorporated the five-point Likert scale, but *Perceived Green Organizational Policy* was reduced to a three-point scale (Not available/Maybe/ Available). Under the same criteria, *Perceived Green Organizational Policy* is converted to the five-point scale.

$$NV = Round\left(\frac{5\left(\sum PGP\right)}{6}\right) \tag{4.3}$$

Where *NV* = New value, *PGP* = Total score of Perceived Green Organizational Policy, and *Round* = round half towards positive infinity.

Table 4.3 Descriptive statistic result of Green Organizational Impact phase

Factor	**Level of significant (Average)**					**x̄**	**S.D.**	**Rank**
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
ISG	9 (1.5%)	16 (2.6%)	61 (9.9%)	290 (46.9%)	242 (39.2%)	4.021	.8334	2
PGP	0	33 (5.3%)	109 (17.6%)	288 (46.6%)	188 (30.4%)	4.197	.8289	1
Overall	**9 (0.7%)**	**49 (4.0%)**	**170 (13.8%)**	**578 (46.8%)**	**430 (34.8%)**	**4.109**	**.8312**	

ISG = Intention to Support Green Imaged Business, PGP = Perceived Green Organizational Policy

Perceived Green Organizational Policy (PGP) ($\bar{x}$ = 4.197; S.D. = .8289) proved that it is more significant than *Intention to Support Green Imaged Business* (ISG) ($\bar{x}$ = 4.021; S.D. = .8334). The overall score of the last phase is $\bar{x}$ = 4.109 and S.D. = .8312.

There are two measurements in this phase. The one is observation of environmental awareness inside respondent's workplace. The other is measuring environmental awareness outside respondent's workplace. Their scores may not be equal, but the both are important.

4.1.4 Summary of descriptive statistic

A comparison among all factors is displayed in table 4.4.

Table 4.4 Summary of descriptive statistic

Factor	$\bar{x}$	S.D.	Level of agreement	Rank
Green IT Introduction				
Perceived Green Benefit (PGB)	4.112	.8647	Agree	1
Resource Sacrifice (RS)	3.877	.8752	Agree	3
Noticeability (NA)	3.935	.7059	Agree	2
Social Influence (SI)	3.367	1.0464	Neutral	4
Overall	3.823	.8731	Agree	
Green Individual Acceptance				
Environmental Concern & Habit (ECH)	4.532	.7222	Strongly Agree	1
Green Intention in Purchasing or Using IT Product (GIP)	4.270	.8443	Agree	2
Overall	4.401	.7833	Agree	
Green Organizational Impact				
Intention to Support Green Imaged Business (ISG)	4.197	.8289	Agree	1

Perceived Green Organizational Policy (PGP)	4.021	.8336	Agree	2
Overall	4.109	.8312	Agree	

The overall result shows that Environmental *Concern & Habit* is the most important factor, while *Social Influence* has the lowest relevance. Compared by phase, Green Individual Acceptance has the highest overall score ($\bar{x}$ = 4.401; S.D. = .7833), followed by Green Organizational Impact ($\bar{x}$ = 4.109; S.D. = .8312), and Green IT Introduction ($\bar{x}$ = 3.823; S.D. = .8731). All three phases win 'important' label of level of importance.

4.2 Preliminary Analysis

4.2.1 Incompatible between Likert items and Normal distribution

Once a researcher decides to process his/her work with the Structural Equation Model, gathered data should be approximately normally distributed (Z-scores of skewness and kurtosis should be somewhere between -1.96 and +1.96). Notwithstanding, categorical data, ranked data, and the likes are clearly discrete (Jackson, 2009, p.62), do not require normalization (some experts suggested to assume it to be normalized). Likert scales are required to be ordinal scale (Neuman, 2011, p. 230) rather than interval scale (Neuman, 2011, p. 239). This study is replete with five-point Likert scales, two-point Yes/No questions, and three-point recognition scales. All data are categorical types and naturally discrete**.** Therefore, the normal distribution test was omitted and rationally assumed to be normal.

4.2.2 Multicollinearity diagnosis

Statistically speaking, when at least two variables are highly correlated in a multiple regression, the phenomenon is called multicollinearity. In potentially results in, fundamentally, a study model twisted due to lack of independence among variables. There are two signs of multicollinearity; (1) a tolerance value lower than 0.2, and (2) the Variance Inflation Factor (VIF) that surpasses 10.

The result of the multicollinearity diagnostic is shown in table 4.5 and 4.6. The examination should be separated into two sections in adherence with the study framework; (1) among variables that impact *Green Intention in Purchasing or Using IT Product* (GIP), and (2) among variables that impact *Intention to Support Green Imaged*

Business (ISG). Results of the two sections are present on table 4.5 and 4.6, respectively.

Table 4.5 Multicollinearity diagnosis with Green Intention in Purchasing or Using IT Product

Variable	Collinearity Statistics	
	Tolerance	**VIF**
Perceived Green Benefit (PGB) (4 items)	.487	2.053
Resource Sacrifice (RS) (3 items)	.578	1.730
Noticeability (NA) (6 items)	.920	1.086
Social Influence (SI) (3 items)	.762	1.312
Environmental Concern & Habit (ECH) (5 items)	.647	1.545
Perceived Green Organizational Policy (PGP) (6 items)	.835	1.197

Method: Enter

Table 4.6 Multicollinearity diagnosis with Intention to Support Green Imaged Business

Variable	Collinearity Statistics	
	Tolerance	**VIF**
Green Intention in Purchasing or Using IT Product (GIP) (3 items)	.873	1.145
Perceived Green Organizational Policy (PGP) (6 items)	.873	1.145

Method: Enter

Table 4.5 and 4.6 show, fortuitously, that there is no sign of multicollinearity. Tolerance values and VIFs of all measurement items are far beyond the value 1 and below 10, respectively. With this result in mind, all data can be processed to construct a validity section.

4.3 Measurement model

Before molding a structural model, a measurement model needs to be forged. Convergent validity and discriminant validity must be tested. According to Neuman (2011) proffered that convergent validity is a type of testing for multiple indicators based on the idea that indicators of one construct may act similar or converge (p. 213). Neuman (2011) also explained discriminant validity; to ascertain multiple indicators based on the idea that indicators of different constructs diverge (p. 214).

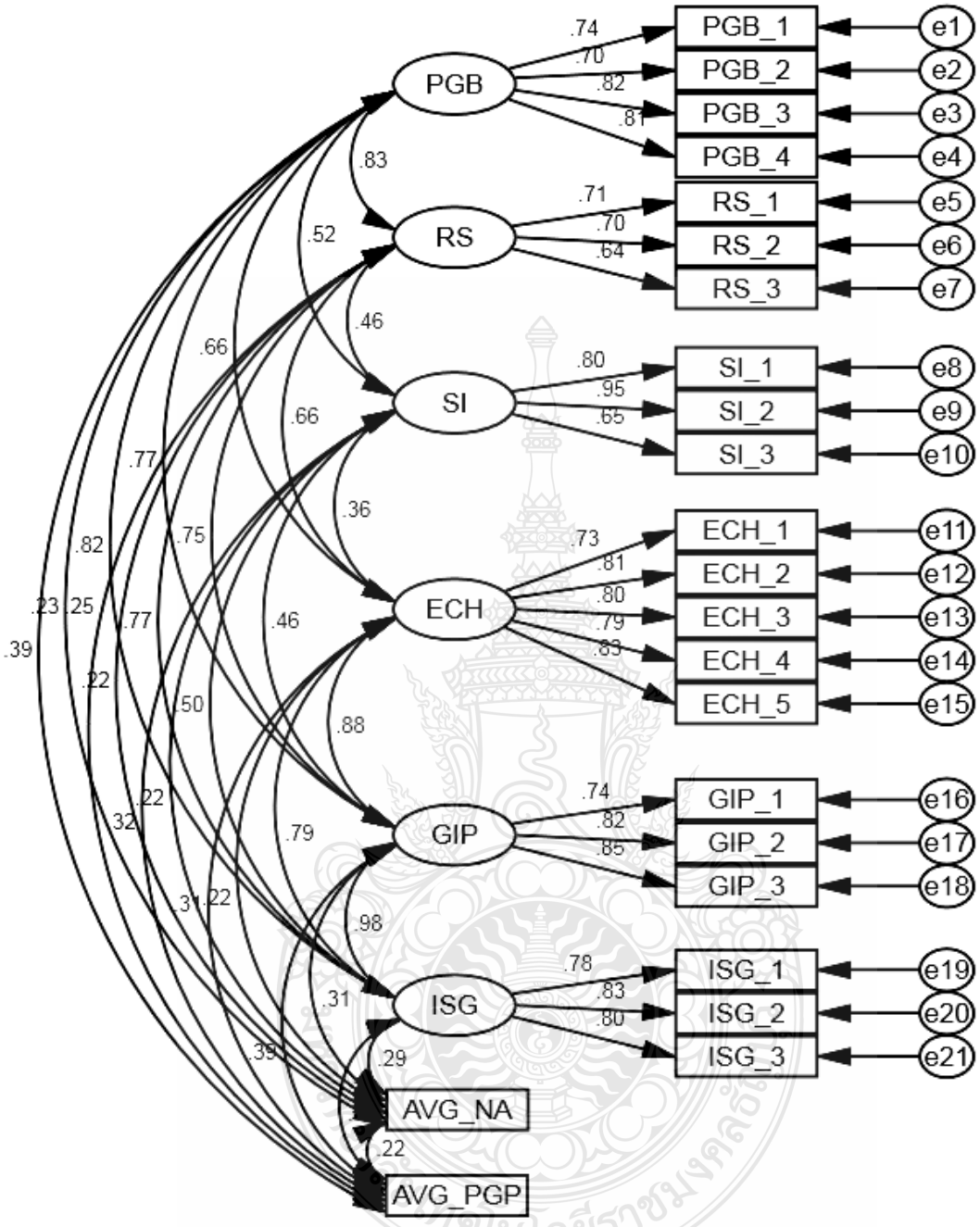
4.3.1 Convergent validity

This study chose to evaluate convergent validity with Confirmatory Factor Analysis (CFA). There are three major purposes of CFA; (1) to confirm reviewed and applied theories in a study, (2) to verify selected study factors, and (3) to bring forth new psychological measurement tools (Angsuchoti et al., 2011, p. 115). Because of these facts, CFA is suitable for this research.

In the questionnaire, two measurement items, *Noticeability* (NA) and *Perceived Green Organizational Policy* (PGP), are not five-point Likert scale as others are. Although these two variables carry many items, this study prefers to treat them as single-indicator variables by calculating their mean scores and transforming them into a single five-point scale for each (equation 4.1, 4.2 and 4.3).

There are two major ways to handle the single-indicator criterion, depending on statistical packages. For LISREL, NA and PGP need to have fixed values of factor loading to 1 and error variance to 0 (Kenny, 2016). For AMOS, NA and PGP must be drawn without latent variables, but their covariance still needs to be connected to the other latent variables (Gaskin, 2016a).

Figure 4.1 was the measurement model during the CFA. A cut-point is .6; all variables that has factor loading below .6 will be excluded.



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,
ECH = Environmental Concern & Habit, PGP = Perceived Green organizational Policy,
NA = Noticeability, GIP = Green Intention to Purchase/use IT product,
ISG = Intention to Support Green Business

Figure 4.1 Measurement Model during Confirmatory Factor Analysis (Default)

Table 4.7 Factor loading of observed variable

Variable	Factor Loading
Perceived Green Benefit (PGB)	
PGB_1 (E-waste Reduction)	.74
PGB_2 (Energy Saving)	.70
PGB_3 (Negative Impact)	.82
PGB_4 (Psychological Benefit)	.81
Resource Sacrifice (RS)	
RS_1 (Financial Sacrifice)	.71
RS_2 (Product Capability Sacrifice)	.70
RS_3 (Temporal Sacrifice)	.64
Noticeability (NA)	
AVG_NA (Mean of 6 two-point scale observed variables)	1 (Fixed)
Social Influence (SI)	
SI_1 (Family 'n Friends)	.80
SI_2 (Workplace)	.95
SI_3 (Media)	.65
Environmental Concern & Habit (ECH)	
ECH_1 (Plastic & Foam)	.73
ECH_2 (Littering)	.81
ECH_3 (Balance)	.80
ECH_4 (Natural Resource)	.79
ECH_5 (Global Warming)	.83
Green Intention in Purchasing or Using IT Product (GIP)	
GIP_1 (Energy Efficiency and Negative Impact)	.74
GIP_2 (Knowledge Searching)	.82
GIP_3 (Eco-labels Awareness)	.85

Table 4.7 Factor loading of observed variable (Cont.)

Variable	Factor Loading
Intention to Support Green Imaged Business (ISG)	
ISG_1 (Concern)	.78
ISG_2 (Visibility)	.83
ISG_3 (Auditability)	.80
Perceived Green Organizational Policy (PGP)	
AVG_PGP (Mean of 6 three-point scale observed variables)	1 (Fixed)

AVG = Average (item is converted into a single-indicator)

Table 4.7 shows that all observed variables are worthy of implementation. The next step is to enumerate them.

In *Perceived Green Benefit*, the best question to measure consumer's notion about perception of environmentally friendly advantages is negative impact topic (PGB_3 = .82), followed by psychological benefit (PGB_4 = .81), e-waste generation (PGB_1 = .74), and energy efficiency (PGB_2 = .70).

Financial sacrifice (RS_1 = .71) is the best predictor for *Resource Sacrifice*. Product capability sacrifice (RS_2 = .70) was the second, and temporal sacrifice (RS_3 = .64) was the third.

Social Influence has the workplace influence (SI_2 = .95) as the best predictor. The next in pertinence was family and friends influence (SI_1 = .80), and media influence (SI_3 = .65), respectively.

The global warming issue (ECH_5 = .83) was the best predictor of *Environmental Concern & Habit*, followed by the topic about balance of nature (ECH_3 = .80), littering behavior (ECH_2 = .81), decreasing natural resources (ECH_4 = .79), and plastic & foam usages (ECH_1 = .73).

In *Green Intention in Purchasing or Using IT Product*, eco-labels awareness of consumers (GIP_3 = .85) was the highest rank, followed by intention to search for environmental knowledge (GIP_2 = .82), and energy efficiency plus negative Impact (GIP_1 = .74).

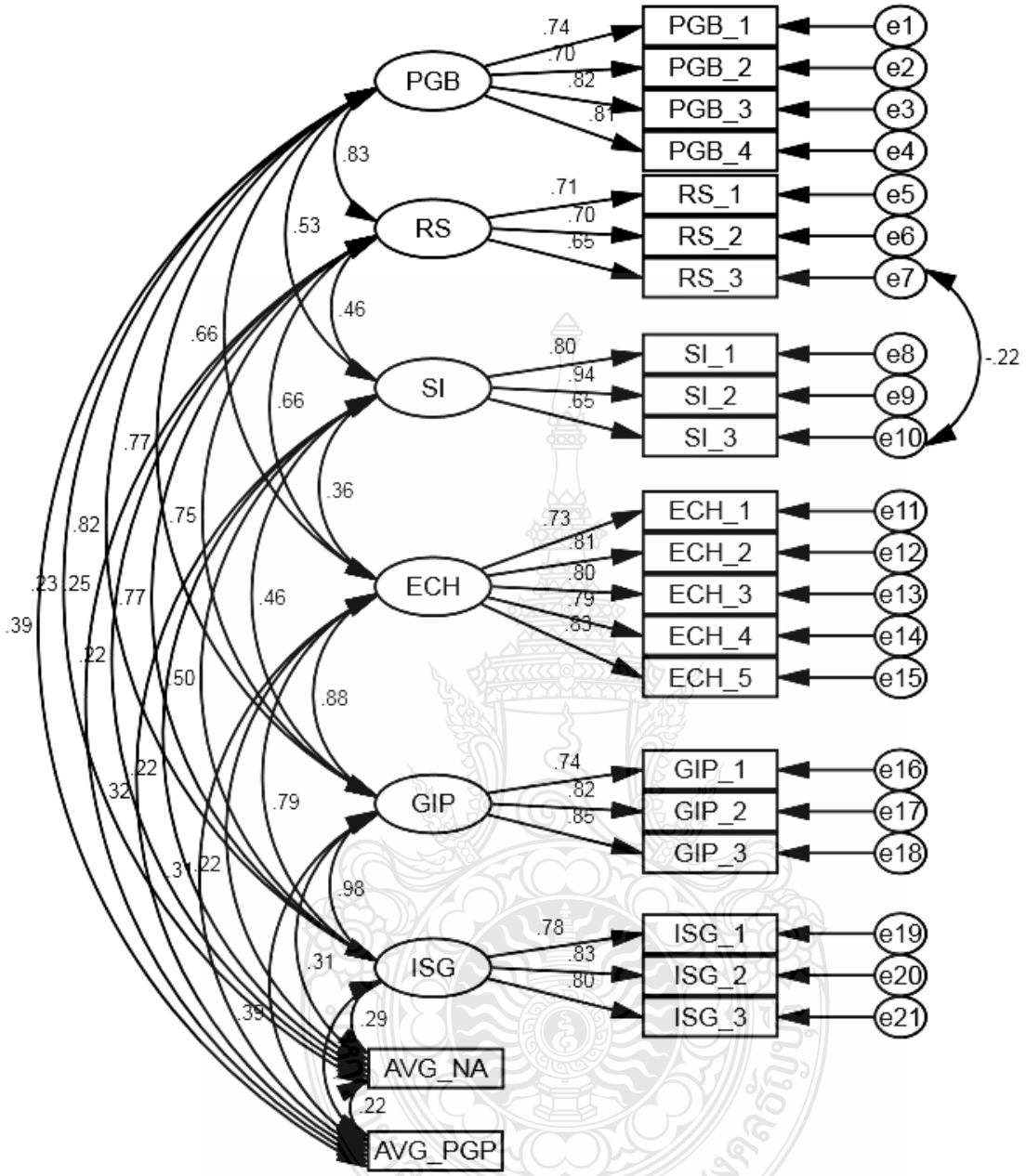
Regarding the environmentally friendly image of a firm, the question about the visibility of green image (ISG_2 = .83) had the greatest factor loading score. The second was auditability of green image/reputation (ISG_3 = .80). The third was concern for such image (ISG_1 = .78).

Most model fit indices are present in table 4.8. Without model modifying, most fit indices met requirements, except the P-value, as shown in table 4.8.

Table 4.8 Fit indices of measurement model

Fit index	Value	Suggested Value	Acceptable
P-value	.000	> .50	No
Chi-square/DF	2.63	≤ 3 (Good)	Yes
SRMR	.0325	≤ .04 (Best)	Yes
RMSEA	.051	≤ .08 (Acceptable)	Yes
NFI	.937	≥ .90 (Acceptable)	Yes
CFI	.960	≥ .95 (Better)	Yes
GFI	.922	≥ .90 (Acceptable)	Yes
AGFI	.895	≥ .90 (Acceptable)	No
Critical N	275	≥ 200 (Acceptable)	Yes

Statistically speaking, it is very uncommon to get a good p-value for the chi-square because the chi-square is allergic to a large sample size (Chadcham, 2004; Vanichbuncha, 2013, p. 109; Diamantopoulos and Siguaw, 2000, p. 84; Jöreskog and Sörbom, 1993, pp. 123-124; Gaskin, 2016b), and high model complexity (Gaskin, 2016b). This study has the both (618 samples; 23 observed variables plus 8 latent variables). For this reason, the P-value should be ignored (Chadcham, 2004; Gaskin, 2016b).



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

Figure 4.2 Measurement Model during Confirmatory Factor Analysis (Adjusted)

However, in order to accept the measurement model when the P-value is lower than .05, the new criterion should be as follows: Chi-square/Degree of Freedom < 3.0; GFI > .90; AGFI >.90; CFI > .95; SRMR < .08; and RMSEA < .06 (Chadcham, 2004). The adjusted goodness of fit index (AGFI) was slightly disqualifying. Thus, model adjustment is necessary. Adjusted study model is display in figure 4.2 and all new fit indices are display in table 4.9.

A statistical package suggested that a bridge between error terms of two observed variables, which is RS_3 (Factor loading = .64) and SI_3 (Factor loading = .65), should be built. As a result, factor loading of RS_3 is increased to .65.

Table 4.9 Fit indices of measurement model (Adjusted)

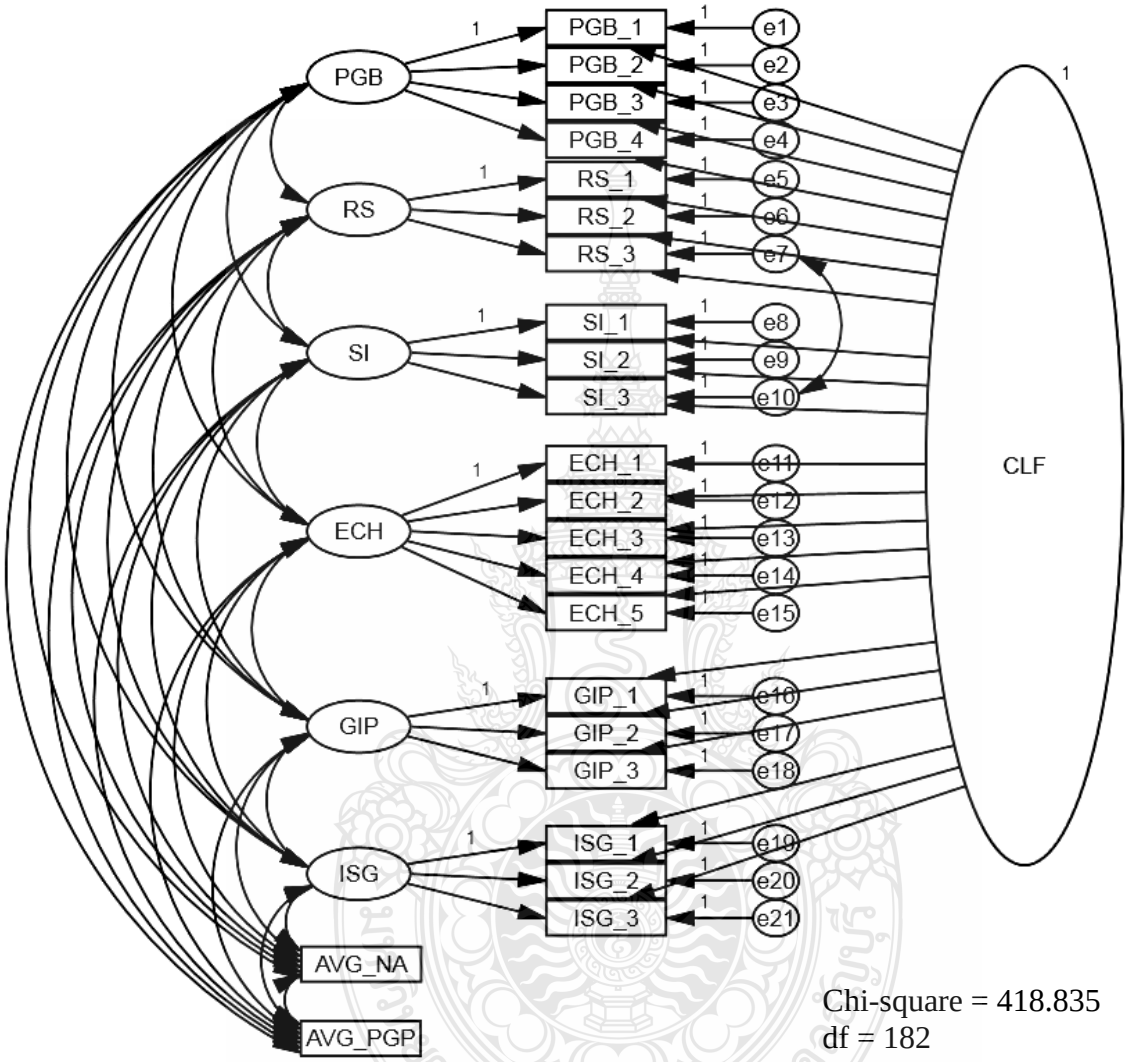
Fit index	Value	Suggested Value	Acceptance
P-value	.000	> .50	Ignoring
Chi-square/DF	2.518	≤ 3 (Good)	Yes
SRMR	.0317	≤ .04 (Best)	Yes
RMSEA	.050	≤ .08 (Acceptable)	Yes
NFI	.940	≥ .90 (Acceptable)	Yes
CFI	.963	≥ .95 (Better)	Yes
GFI	.927	≥ .90 (Acceptable)	Yes
AGFI	.900	≥ .90 (Acceptable)	Yes
Critical N	287	≥ 200 (Acceptable)	Yes

The AGFI is made to .90, the acceptable score. Accordingly, the adjusted measurement model is fit. The next section will be a validation of divergence.

4.3.2 Discriminant validity

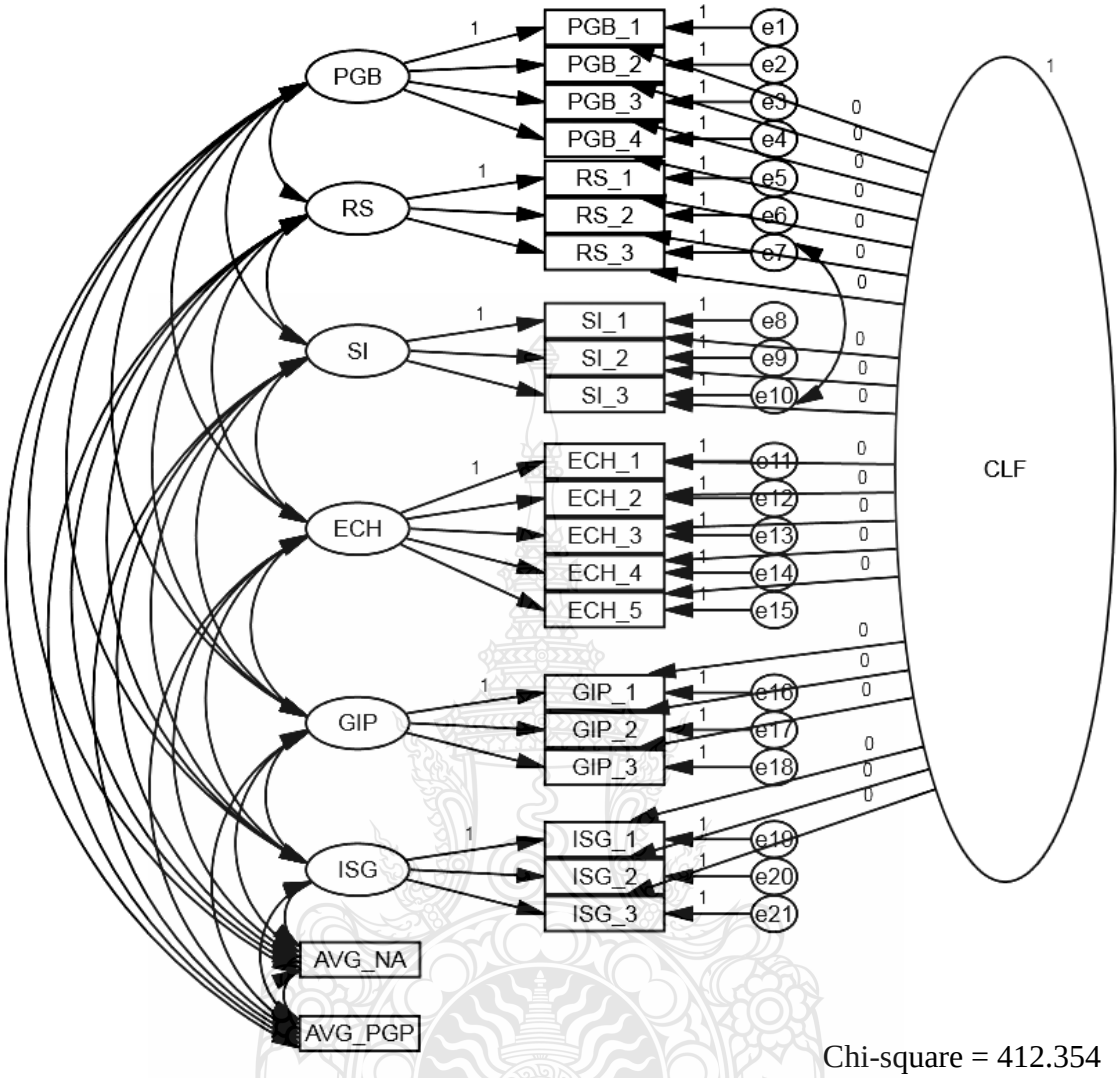
Similarity among different latent variables may cause a warped result. A researcher should scrutinize to validate that there is less predictability on other factors. This study performs the validation with Common Latent Factor (CLF) connection. Begin with create a latent variable (fixed variance to 1) and connect to all observed variables. Creating two models: (1) unconstrained (figure 4.3), and (2) fully constrained

(figure 4.4). Chi-square, Degree of freedom, and P-value between two models are audited by using a tool (Excel StatTools created by Gaskin, 2016c).



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

Figure 4.3 Unconstrained Measurement Model during Common Latent Factor



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

Figure 4.4 Fully constrained Measurement Model during Common Latent Factor

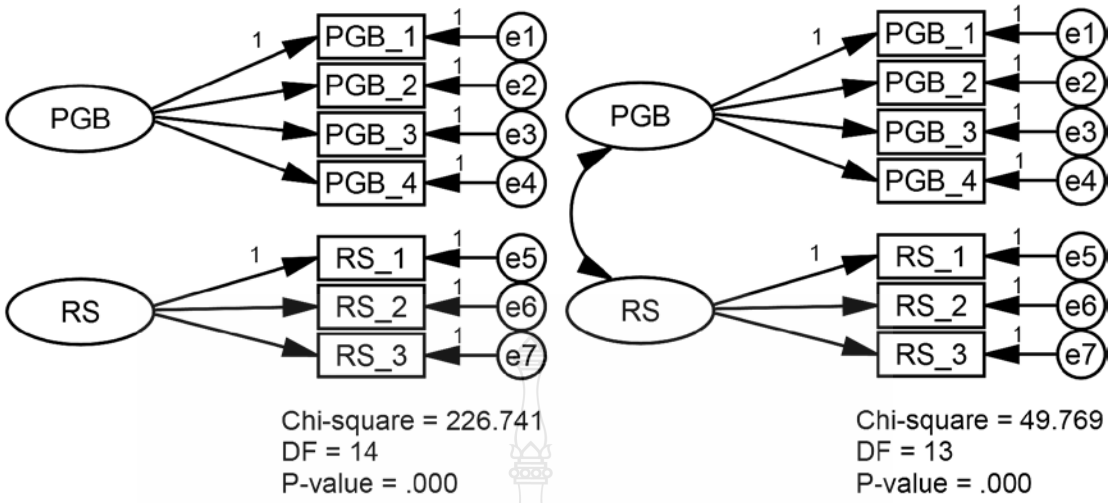
The difference between unconstrained model and fully constrained model is shown in table 4.10.

Table 4.10 Calculated Chi-square different testing

Overall Model	Chi-square	df	P-value	Invariant?
Unconstrained	418.835	182	.000	
Fully constrained	412.354	203	.000	
Number of groups		2		
Difference	6.481	21	.999	YES

A P-value that exceeds .50 proves the potential for the existence of discriminant validity among the variables. To be more cautious in the validation, all latent variables have to be checked one-by-one.

Zaiț and Bertea (2011) channelized that Chi-square difference test is one of the homogeneity examinations. Similar to the previous CLF method, two models need to be compared; one, that two constructs do not correlate (zero correlation), and the other is two constructs are correlated (free correlation). After which the different chi-square and degrees of freedom will be ciphered for p-value. The difference between the previous CLF and this method is: if it is significant (< 0.05), two constructs present discriminant validity. There are many tools to compute chi-square distribution value. For example, Soper's (2016) online calculator, and chi-square distribution (CHIDIST) function in spreadsheet software. This study will exemplify the whole procedure with a match of PGB versus RS.



PGB = Perceived Green Benefit, RS = Resource Sacrifice

Figure 4.5 Two models for Chi-square difference test

The left side of the figure is the zero-correlation model, while the free-correlation model is on the right.

Table 4.11 Calculated Chi-square different testing of two constructs

Value	Zero-correlation model	Free-correlation model	Different
Chi-square (X^2)	226.741	49.769	**176.972**
Degrees of freedom	14	13	**1**
Probability level	.000	.000	**.000**

Fortuitously, the new p-value was .000 (< .050). This presents discriminant validity between PGB and RS.

Table 4.12 shows outputs of such validation among all constructs. The output shows all different probability level were 0.000. Such result established that all constructs present discriminant validity.

Table 4.12 Calculated Chi-square different testing of all constructs

	PGB			RS			SI			ECH			GIP			ISG			NA		
RS	X^2	*df*	*p*																		
	226.741	14	.000																		
	49.769	13	.000																		
	176.972	**1**	**.000**																		
SI	X^2	*df*	*p*	X^2	*df*	*p*															
	151.601	14	.000	118.136	9	.000															
	45.789	13	.000	43.266	8	.000															
	105.812	**1**	**.000**	**74.87**	**1**	**.000**															
ECH	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*												
	228.451	27	.000	185.308	20	.000	111.096	20	.000												
	87.332	26	.000	60.23	19	.000	53.962	19	.000												
	141.119	**1**	**.000**	**125.078**	**1**	**.000**	**57.134**	**1**	**.000**												
GIP	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*									
	230.258	14	.000	168.775	9	.000	108.183	9	.000	282.209	20	.000									
	59.845	13	.000	19.451	8	.013	23.399	8	.003	76.459	19	.000									
	170.413	**1**	**.000**	**149.324**	**1**	**.000**	**84.784**	**1**	**.000**	**205.75**	**1**	**.000**									
ISG	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*						
	247.764	14	.000	192.747	9	.000	114.634	9	.000	240.296	20	.000	764.160	9	.000						
	60.111	13	.000	34.148	8	.000	18.941	8	.015	71.399	19	.000	58.398	8	.000						
	187.653	**1**	**.000**	**158.599**	**1**	**.000**	**95.693**	**1**	**.000**	**168.897**	**1**	**.000**	**705.762**	**1**	**.000**						
NA	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*			
	46.835	6	.000	26.469	3	.000	28.943	3	.000	63.642	10	.000	47.140	3	.000	41.133	3	.000			
	21.14	5	.001	6.775	2	.034	1.810	2	.404	39.527	9	.000	1.713	2	.425	0.566	2	.754			
	25.695	**1**	**.000**	**19.694**	**1**	**.000**	**27.133**	**1**	**.000**	**24.115**	**1**	**.000**	**45.427**	**1**	**.000**	**40.567**	**1**	**.000**			
PGP	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*	X^2	*df*	*p*
	90.296	6	.000	27.585	3	.000	56.431	3	.000	86.063	10	.000	71.186	3	.000	79.077	3	.000	30.589	1	.000
	21.559	5	.001	0.153	2	.926	4.492	2	.106	39.245	9	.000	0.377	2	.828	1.898	2	.387	0	0	-
	68.737	**1**	**.000**	**27.432**	**1**	**.000**	**51.939**	**1**	**.000**	**46.818**	**1**	**.000**	**70.809**	**1**	**.000**	**77.179**	**1**	**.000**	**30.589**	**1**	**.000**
	PGB			**RS**			**SI**			**ECH**			**GIP**			**ISG**			**NA**		

Note:

NA and **PGP** are single-indicator variables. Their p-value of free-correlation model, therefore, cannot be computed. (Zero degree of freedom is reached)

The question yet remains: should a social investigator say that results from CLF and chi-square different test were enough? As Zaiț and Bertea (2011) guided, appropriateness between a square root of Average Variance Extracted (AVE) and correlation is needed to prove heterogeneity. The AVE is also known as Rho vc ('Rho' means alpha and 'vc' stands for "versus composite reliability"). There are Rho vc computation tools, for example the online tool created by Korchia (2010).

AVE (Rho vc) of all latent variables are shown in table 4.13, and matching correlations in table 4.14 (NA and PGP are not displayed because they are single-indicator variables).

Table 4.13 AVE Computation (original)

Construct	**Joreskog Rho (Reliability)**	**AVE (Rho vc)**	$\sqrt{AVE}$
Perceived Green Benefit (PGB)	0.857	0.601	0.7752
Resource Sacrifice (RS)	0.730	0.440	0.6633
Social Influence (SI)	0.845	0.652	0.8075
Environmental Concern & Habit (ECH)	0.899	0.641	0.8006
Green Intention to Purchase/use IT product (GIP)	0.849	0.653	0.8081
Intention to Support Green business (ISG)	0.843	0.643	0.8019

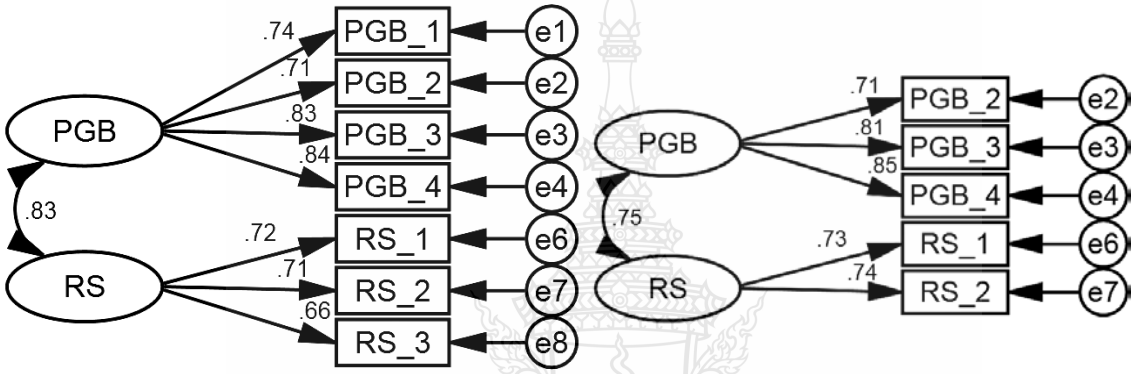
Table 4.14 Correlations of all constructs (original)

	PGB	**RS**	**SI**	**ECH**	**GIP**
Resource Sacrifice (RS)	**0.83**				
Social Influence (SI)	0.50	0.46			
Environmental Concern & Habit (ECH)	0.63	0.65	0.36		
Green Intention to Purchase/use IT product (GIP)	0.74	0.74	0.45	**0.88**	
Intention to Support Green business (ISG)	**0.79**	0.75	0.49	0.78	**0.93**

PGB = Perceived Green Benefit

A warning sign appeared when correlation surpassed the square root of AVE. For instance, a correlation between PGB and RS was 0.83, but a square root of AVE of PGB and RS was only .775 and .663, respectively. The same phenomenon also occurred with PGB vs. ISG, ECH vs. GIP, and GIP vs. ISG. Some observed variables in the constructs need to be reasonably removed.

Next, this study utilizes adjustment of PGB vs. RS to show a statistical alteration.



PGB = Perceived Green Benefit, RS = Resource Sacrifice

Figure 4.6 Original and calibrated models (PGB vs. RS)

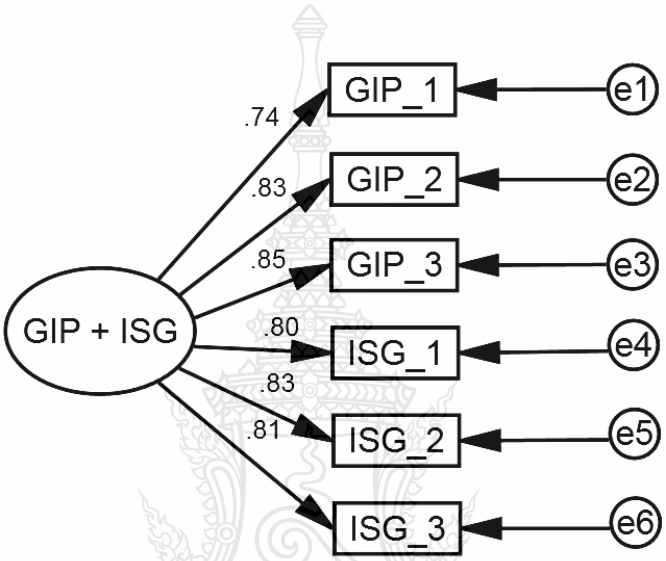
Table 4.15 AVE Computation (calibrated PGB vs. RS)

Construct	Joreskog Rho (Reliability)	AVE (Rho vc)	$\sqrt{AVE}$
Perceived Green Benefit (PGB)	0.831	0.624	0.7899
Resource Sacrifice (RS)	0.728	0.579	0.7609

After absence of PGB_1 and RS_3, the correlation decreased to .75, and square root of AVE of PGB and RS became .789 and .761, respectively. At this moment, the correlation was less than square root of AVE of the two constructs. PGB_1 and RS_3 will be permanently removed accordingly.

ECH, GIP and ISG have very serious discriminant validity issues. Although some observed items are dropped, such issues are not solved. Farrell (2010) explained

that insufficient discriminant validity may leave no option “but to combine constructs into one overall measure”, or eliminate a construct. GIP and ISG are intention measurements, which have a high probability for respondents to give between 4 and 5 agreement score. In other words, supporting a business is to buy products from that business, and vice versa. Accordingly, there is no option but the integration of GIP and ISG. Table 4.16 shows a new square root of AVE from the combination.

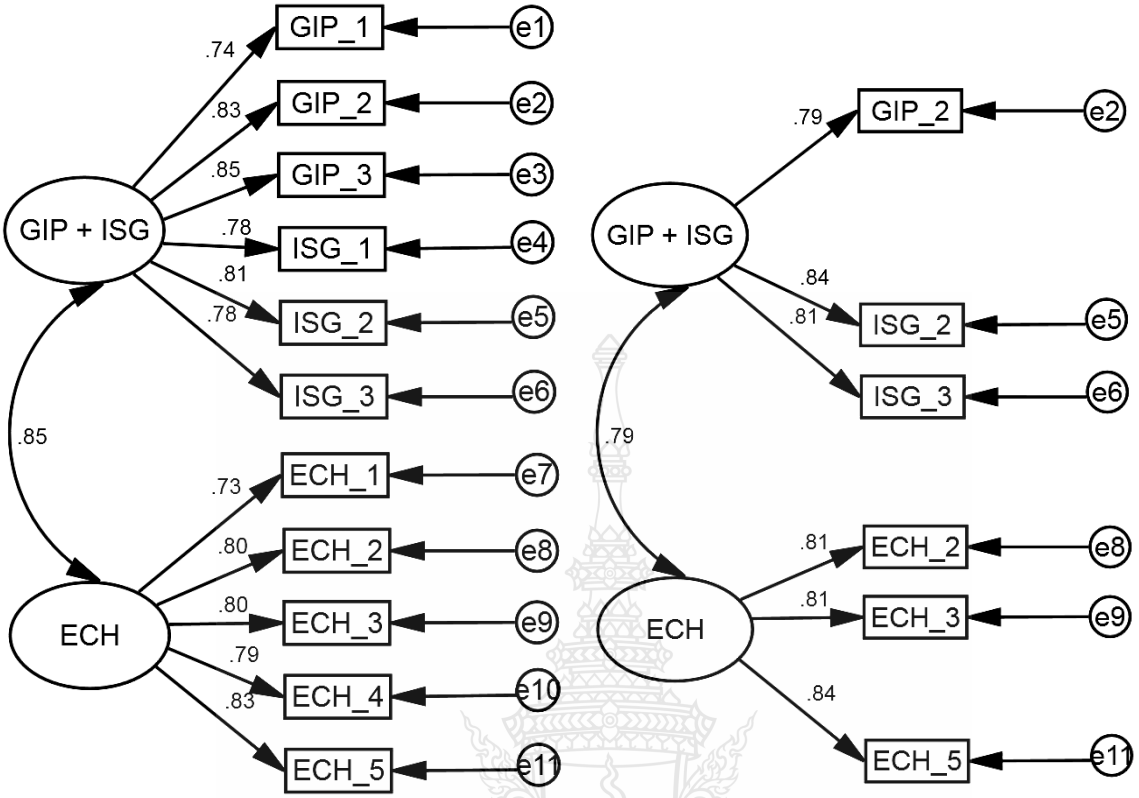


GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

Figure 4.7 Combination of GIP and ISG

Table 4.16 AVE Computation (GIP, ISG and GIP + ISG)

Construct	**Joreskog Rho (Reliability)**	**AVE (Rho vc)**	$\sqrt{AVE}$
Green Intention to Purchase/use IT product (GIP)	0.849	0.653	0.8081
Intention to Support Green business (ISG)	0.843	0.643	0.8019
GIP + ISG	0.920	0.657	0.8156



GIP = Green Intention to Purchase/use IT product,

ISG = Intention to Support Green business

Figure 4.8 Original and calibrated models (GIP + ISG vs. ECH)

Table 4.17 AVE Computation (calibrated GIP + ISG and ECH)

Construct	**Joreskog Rho (Reliability)**	**AVE (Rho vc)**	$\sqrt{AVE}$
GIP + ISG	0.858	0.669	0.8179
Environmental Concern & Habit (ECH)	0.863	0.678	0.8234

GIP = Green Intention to Purchase/use IT product,

ISG = Intention to Support Green business

Originally, when matching ECH and the combination of GIP and ISG, their correlation was .85. This number was too high to be accepted, as the square root of AVE

of GIP + ISG was about .811. This forced ECH and GIP + ISG to take out some items. The best solution was the elimination of five observed variables as follows: GIP_1, GIP_3, ISG_1, ECH_1, and ECH_4. The new correlation was .79, which is under square roots of AVE of both constructs.

Table 4.18 AVE Computation (calibrated)

Construct	Joreskog Rho (Reliability)	AVE (Rho vc)	$\sqrt{AVE}$	Removal
PGB	0.831	0.624	0.7899	PGB_1
RS	0.728	0.579	0.7609	RS_3
SI	0.845	0.652	0.8075	-
ECH	0.863	0.678	0.8234	ECH_1, ECH_4
GIP + ISG	0.855	0.664	0.8149	GIP_1, GIP_3, ISG_1

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green business

Table 4.19 Correlations of all constructs (calibrated w/single-indicators)

	PGB	RS	SI	ECH	GIP + ISG	NA
RS	0.754					
SI	0.504	0.461				
ECH	0.631	0.594	0.356			
GIP + ISG	0.783	0.711	0.484	0.787		
NA	0.226	0.189	0.222	0.215	0.292	
PGP	0.370	0.249	0.319	0.309	0.410	0.220

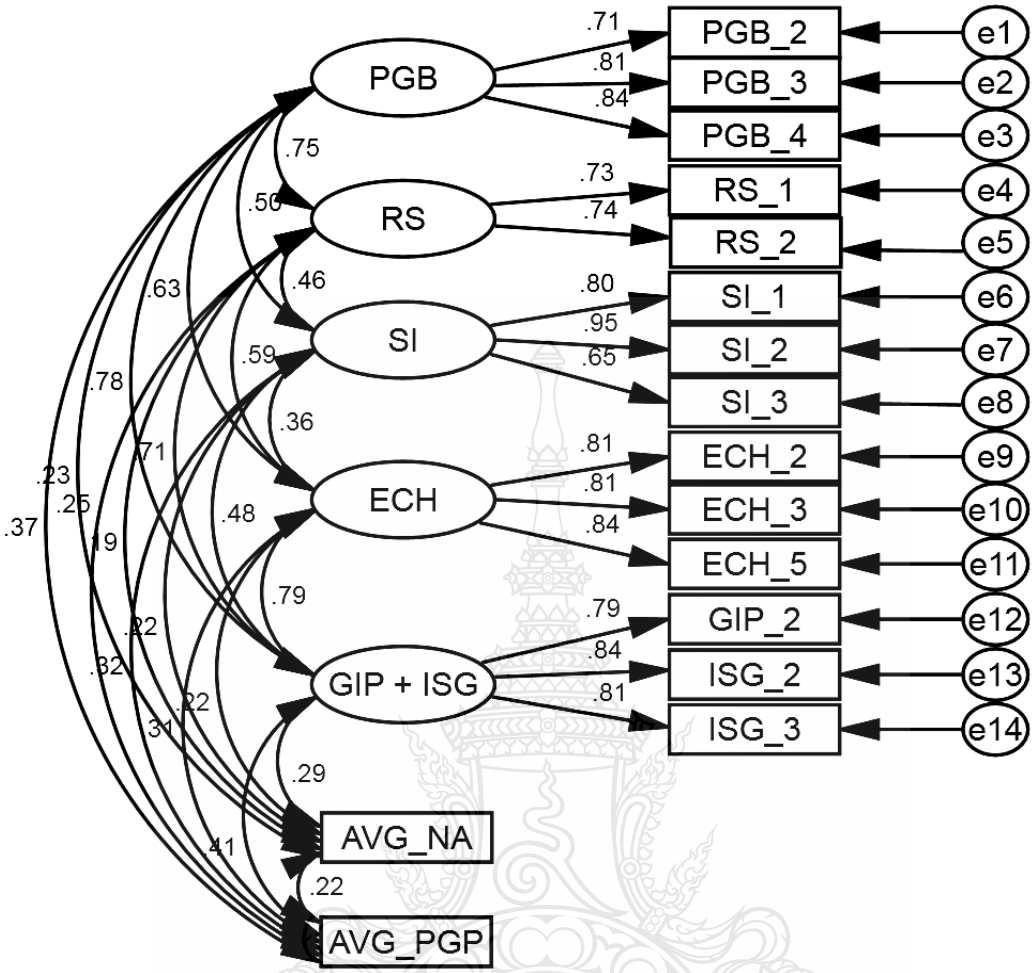
PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green business

Reliability test and discriminant validation for a single-indicator is unable to be performed. Although a method called 'Test-Retest' is available, such validation is suitable for longitudinal study, not a cross-sectional one. Statistical validation for a single-indicator in cross-sectional study is quite impossible, but literarily validation could be possible. This study followed Fuchs and Diamantopoulos' (2009) criteria for the use of single-item measure, and found that nature of NA and PGP, research objectives and sampling consideration are matched. Therefore, all multiple-indicator constructs and single-indicator constructs present discriminant validity.

The results of running CFA with the calibrated model are illustrated in figure 4.9 and table 4.20.

Table 4.20 Fit indices of calibrated measurement model

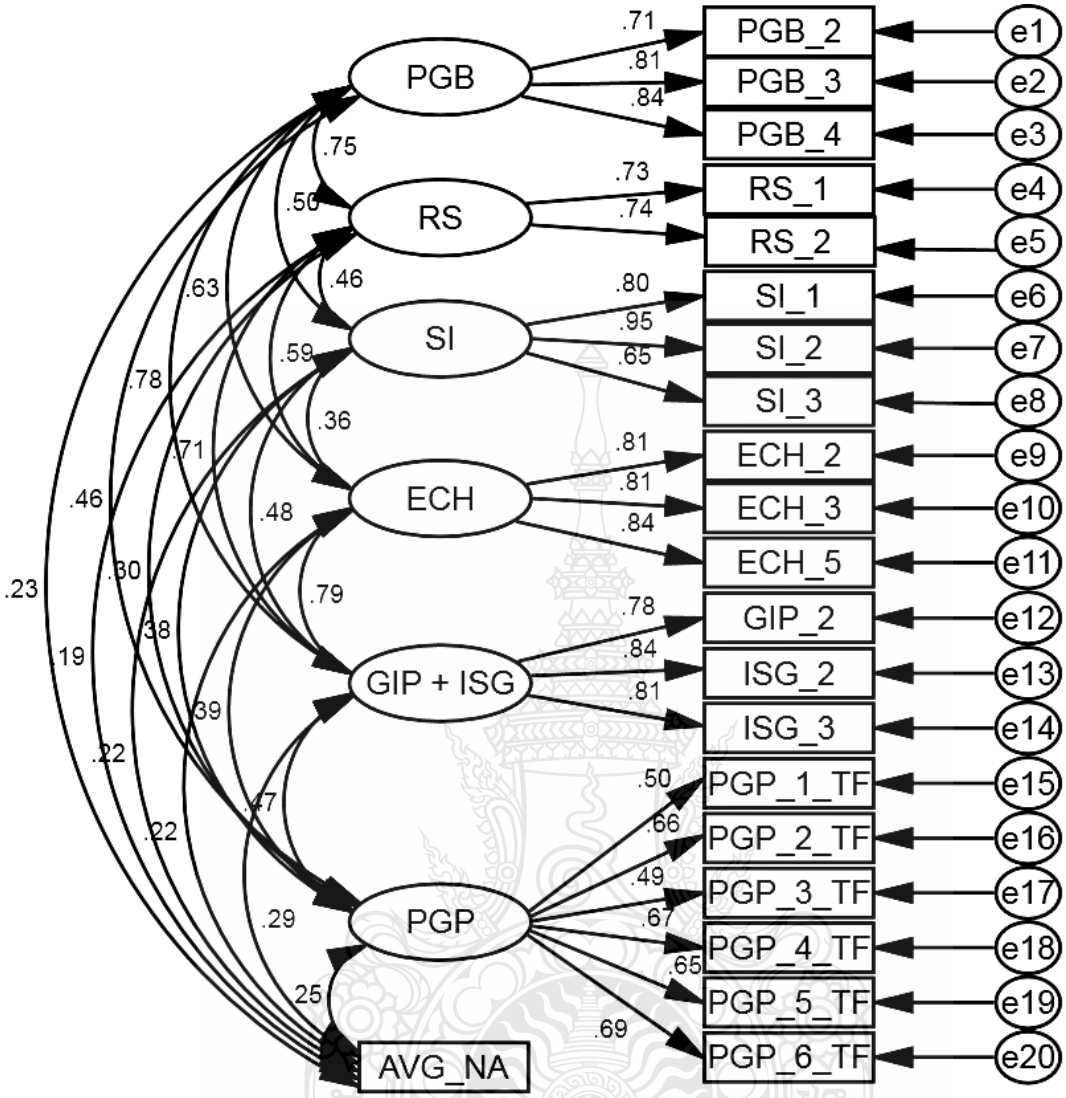
Fit index	Value	Suggested Value	Acceptance
P-value	.000	> .50	Ignoring (Large sample size)
Chi-square/DF	2.022	≤ 3.0 (Good)	Yes
SRMR	.027	≤ .04 (Best)	Yes
RMSEA	.041	≤ .05 (Good)	Yes
NFI	.966	≥ .95 (Good)	Yes
CFI	.982	≥ .97 (Best)	Yes
GFI	.965	≥ .95 (Good)	Yes
AGFI	.943	≥ .90 (Acceptable)	Yes
Critical N	387	≥ 200 (Acceptable)	Yes



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

Figure 4.9 Calibrated models

The calibrated measure model showed very good fit indices at the first time of running CFA. These results confirmed that convergent validity and discriminant validity existed. However, for a depth scrutiny in PGP, PGP there was a need to expand into six items; separate the six policies. All PGP observed variables are transformed from three-point scale into five-point scale.



PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business, TF = transformed into 5-point scale

Figure 4.10 Calibrated models with expanded PGP

Table 4.21 Fit indices of calibrated measurement model with expanded PGP

Fit index	Value	Suggested Value	Acceptance
P-value	.000	> .50	Ignoring (Large sample size)
Chi-square/DF	2.354	≤ 3.0 (Good)	Yes
SRMR	.043	≤ .05 (Good)	Yes
RMSEA	.047	≤ .05 (Good)	Yes
NFI	.966	≥ .95 (Good)	Yes
CFI	.961	≥ .95 (Better)	Yes
GFI	.936	≥ .90 (Acceptable)	Yes
AGFI	.913	≥ .90 (Acceptable)	Yes
Critical N	311	≥ 200 (Acceptable)	Yes

Table 4.22 AVE Computation (calibrated) with expanded PGP

Construct	Joreskog Rho (Reliability)	AVE (Rho vc)	$\sqrt{AVE}$	Removal
PGB	0.831	0.624	0.7899	PGB_1
RS	0.728	0.579	0.7609	RS_3
SI	0.845	0.652	0.8075	-
ECH	0.863	0.678	0.8234	ECH_1, ECH_4
GIP + ISG	0.855	0.664	0.8149	GIP_1, GIP_3, ISG_1
PGP (expanded)	0.784	0.381	0.6173	-

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,

ECH = Environmental Concern & Habit, PGP = Perceived Green organizational Policy

GIP = Green Intention to Purchase/use IT product,

ISG = Intention to Support Green business

Table 4.23 Correlations of all constructs (calibrated w/ expanded PGP)

Construct	PGB	RS	SI	ECH	GIP + ISG	NA
RS	0.754					
SI	0.504	0.461				
ECH	0.631	0.594	0.356			
GIP + ISG	0.783	0.711	0.484	0.787		
NA	0.226	0.189	0.222	0.215	0.292	
PGP (exp.)	0.461	0.300	0.379	0.385	0.472	0.246

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,
ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product,
ISG = Intention to Support Green business

The expansion of PGP caused no trouble to the fine-tuned model. Model fitness was good, reliability was also good, and the model presented discriminant validity. Correlations between all latent variables and PGP were lower than the square root of AVE of expanded PGP (0.6173). The model without expanded PGP will explain overall impact from organizational context to the intention of an individual. The model with expanded PGP will clarify impact of each policy ton an individual. PGP as a single variable can be applied as a moderator to distinguish impacts between groups.

It may not be suitable for NA that it was not to be allowed to expand itself. The NA's nature is to measure general green-label recognition not to measure label separately. Following study purpose, there is no benefit to expand NA.

The next section is structural modeling, which has hypotheses tests, moderating factor tests, and multiple group analysis.

4.4 Structural model

Broadly speaking, there is a minimum requirement of sample size for each structural model. Using triangular number equation, as follows:

$$\sum_{k=1}^{n} k = \frac{n(n+1)}{2} \tag{4.4}$$

Where k = minimum requirement of sample size, n = number of observed variables.

$$136 = \frac{16(16+1)}{2} \tag{4.5}$$

The minimum requirement of the study model is 136 respondents. Therefore, the model has a more than acceptable sample size (618 respondents). P-value will be stuck at .000 and AGFI may under .9 because of huge sample size plus model complexity, this allowed it to be ignored as many statisticians have pointed out (e.g., Gaskin, 2016b; Jöreskog and Sörbom, 1993, pp. 123-124, Diamantopoulos and Siguaw, 2000, p. 84; Chadcham, 2004; Vanichbuncha, 2013, p. 109).

This section is composed of two parts: 'Hypothesis Proving' is an analysis and hypothesis judgments as discussed in previous chapters; and 'Result Enlargement.'

Hypothesis Proving: (1) Non-moderated structural model, (2) Moderating effect analysis (7 models), and (3) Hypotheses judgment.

Result Enlargement: (1) Multiple-group analysis for gender (2 models), (2) Multiple-group analysis for age (4 models), (3) Multiple-group analysis for educational experience (3 models), and (4) Multiple-group analysis for PGP (4 models).

4.4.1 Hypothesis Proving

The initial part begins with figure 4.11, path analysis of the original structural model and moderated structural models. This section gives statistical proving for the five hypotheses.

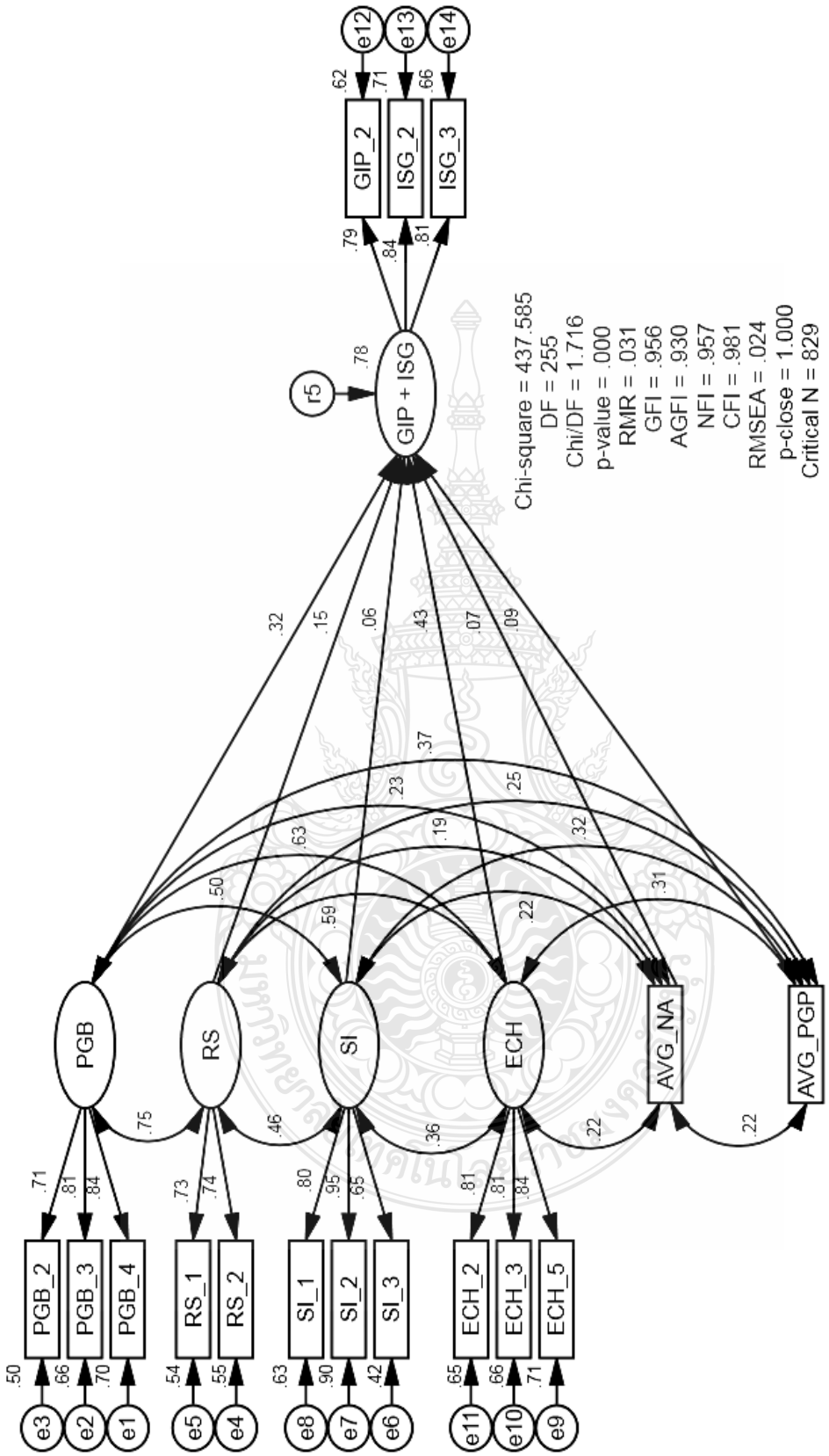


Figure 4.11 Standardized structural model

Table 4.24 Result of non-moderated model path analysis

Variable	Regression Weights				Standardized Regression Weight (β)
	Estimate	S.E.	C.R.	p	
GIP + ISG ← PGB	.365	.076	4.819	.000*	.316
GIP + ISG ← RS	.139	.058	2.383	.017*	.155
GIP + ISG ← SI	.045	.028	1.603	.109	.056
GIP + ISG ← ECH	.507	.054	9.396	.000*	.435
GIP + ISG ← NA	.070	.030	2.325	.020*	.066
GIP + ISG ← PGP	.079	.027	2.878	.004*	.088

Acceptable significant level = < .05 (p = *),

Coefficient of determination (R^2) = .78

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,

ECH = Environmental Concern & Habit, NA = Noticeability,

PGP = Perceived Green organizational Policy

This diagram shows acceptable fit indices. Perceived Green Benefit (PGB) positively impacted Green intention to purchase IT products and support business (GIP + ISG) (β = .316, p = .000). Resource sacrifice (RS) has weak positive influence on GIP + ISG (β = .155, p = .017). The overall result shows that merely Social influence (SI) was not significant for green intention in consumption (GIP + ISG). Environmental concern and habit are positively affected GIP + ISG (β = .435, p = .000). Noticeability carried very weak but positive effect on GIP + ISG (β = .066, p = .020). Finally, perceived green policy (PGP) had a weak positive impact GIP + ISG (β = .088, p = .004).

The next figures (4.12 to 4.18) are path analysis with moderating factors. There will be seven models to be computed (G, A, E, G×A, G×E, A×E, and G×A×E).

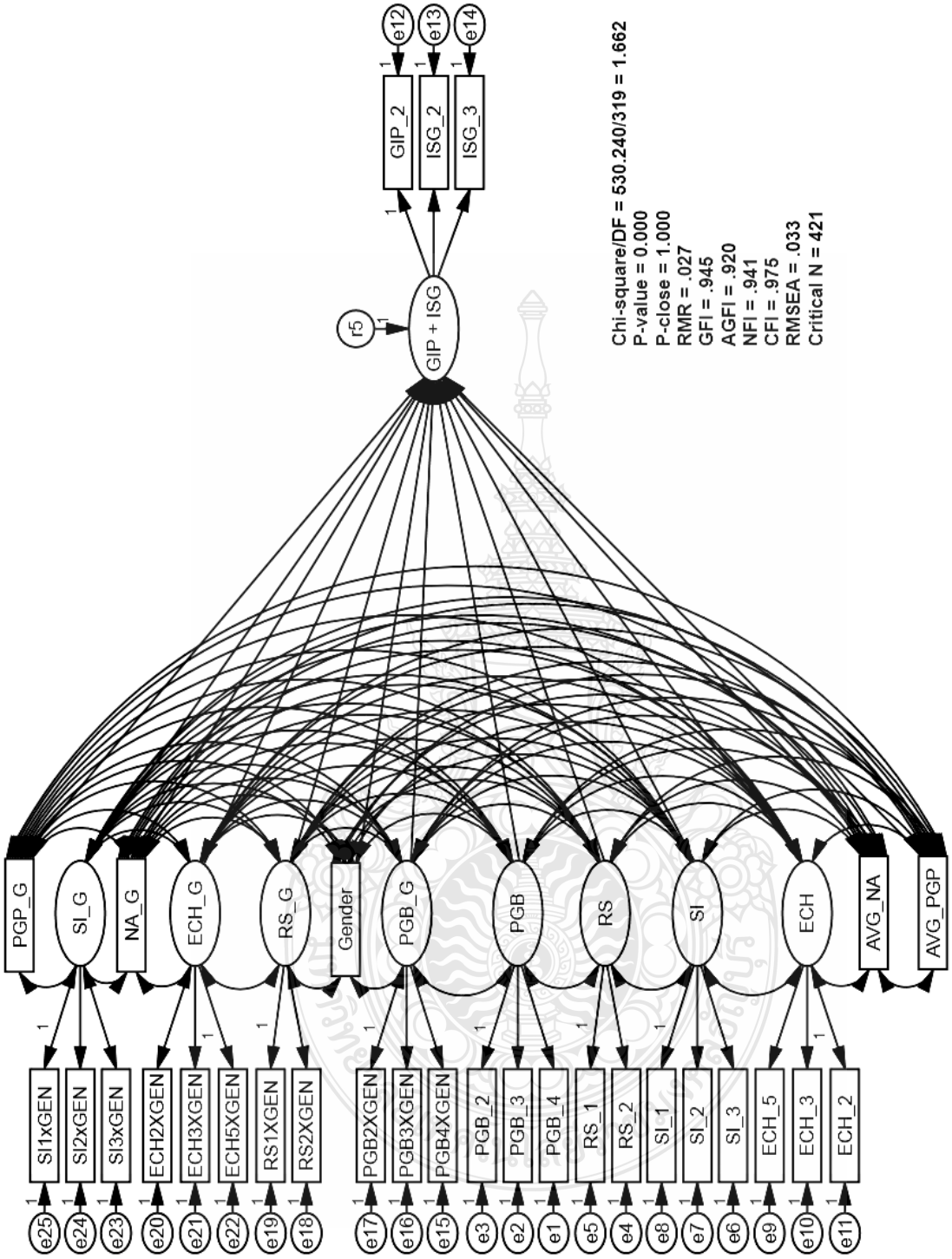


Figure 4.12 Structural model (gender interacting)

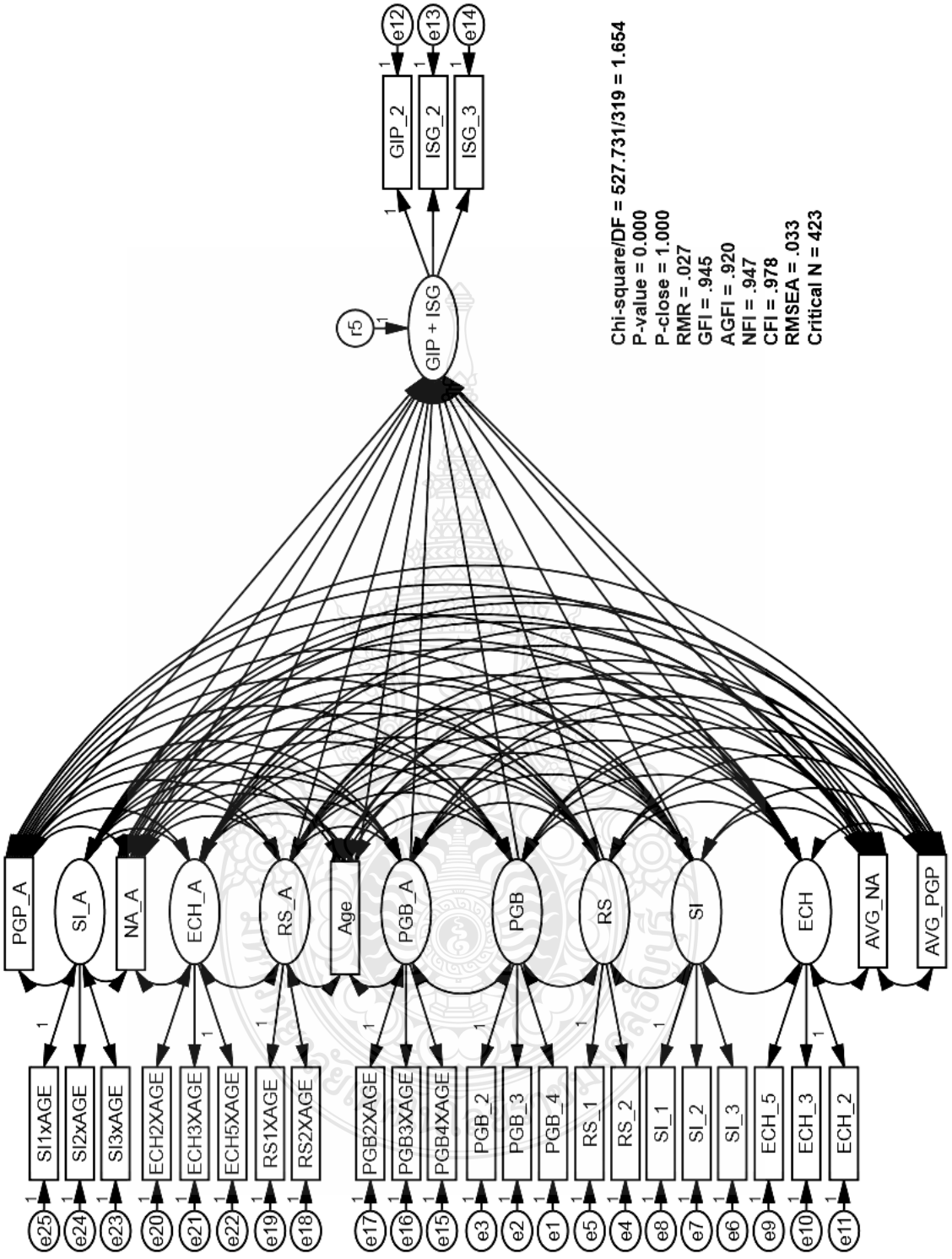


Figure 4.13 Structural model (age interacting)

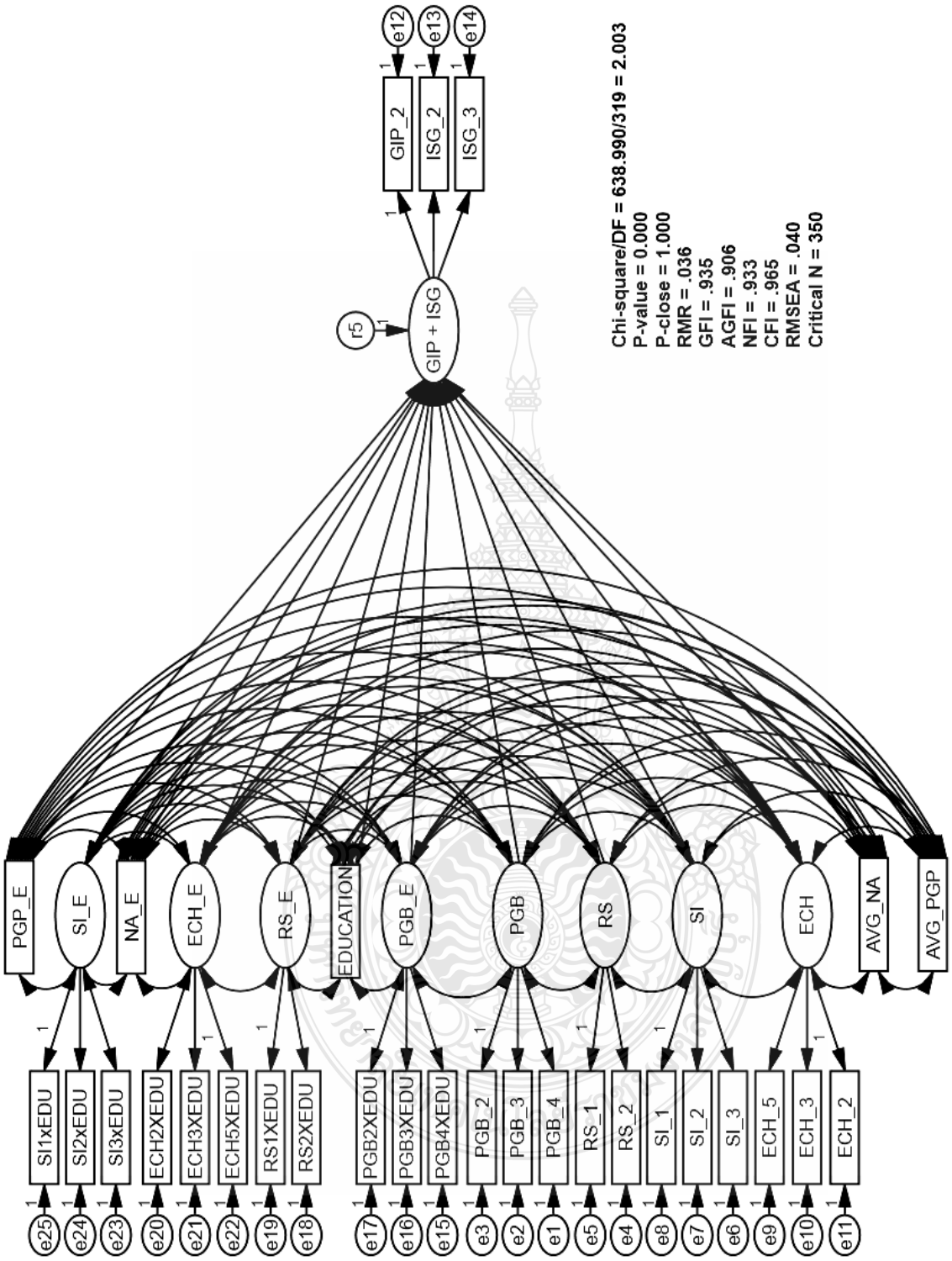


Figure 4.14 Structural model (educational experience interacting)

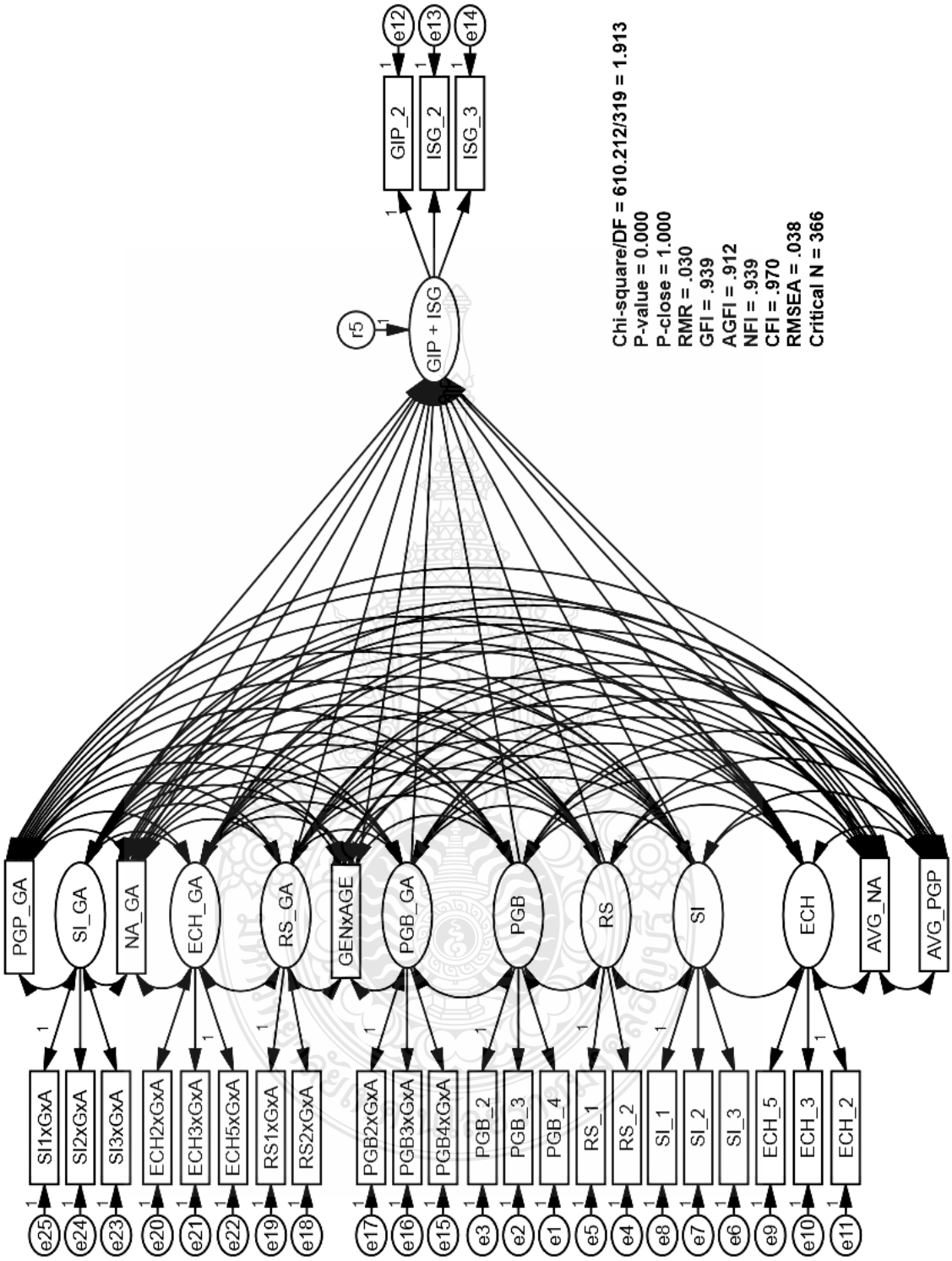


Figure 4.15 Structural model (gender and age interacting)

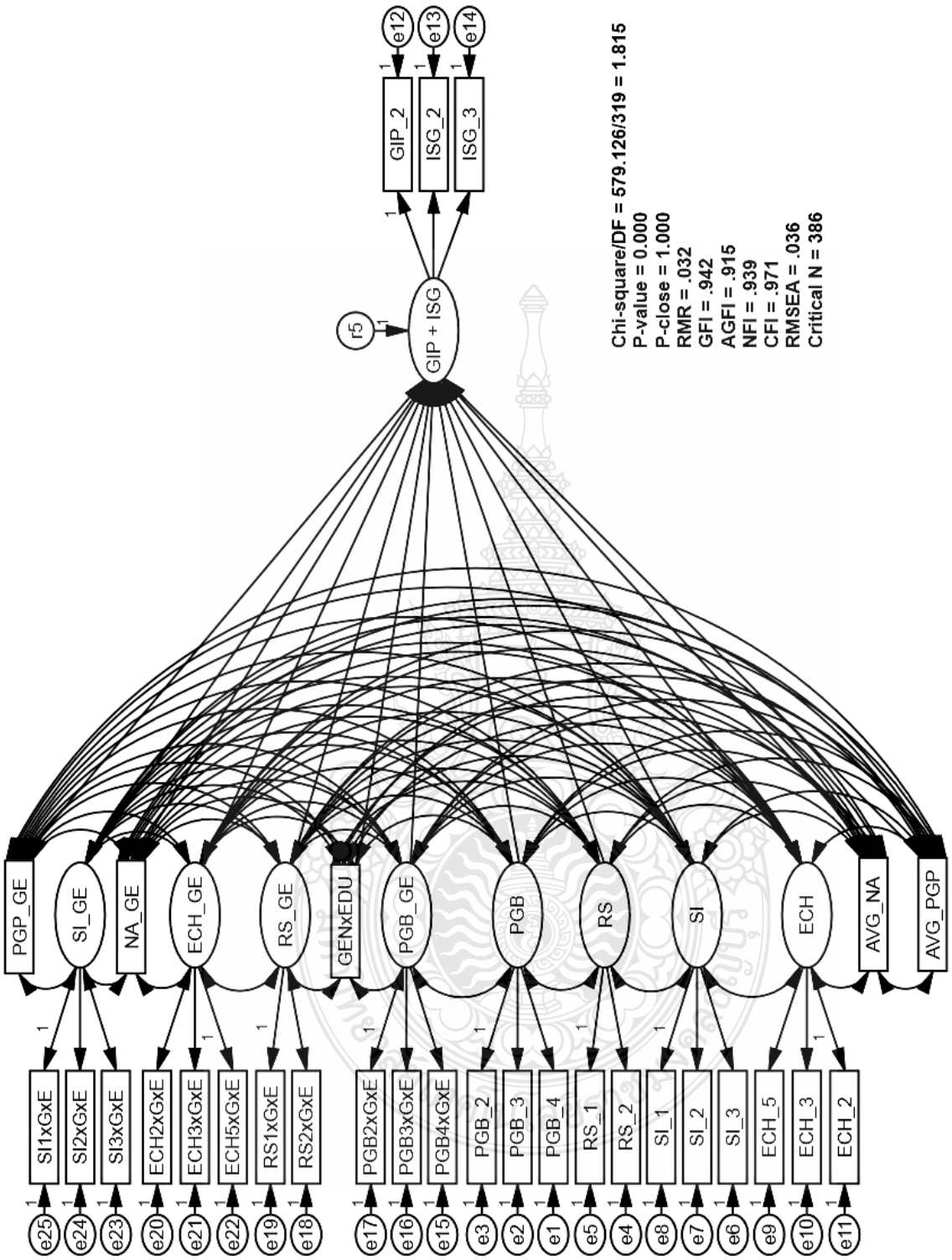


Figure 4.16 Structural model (gender and education interacting)

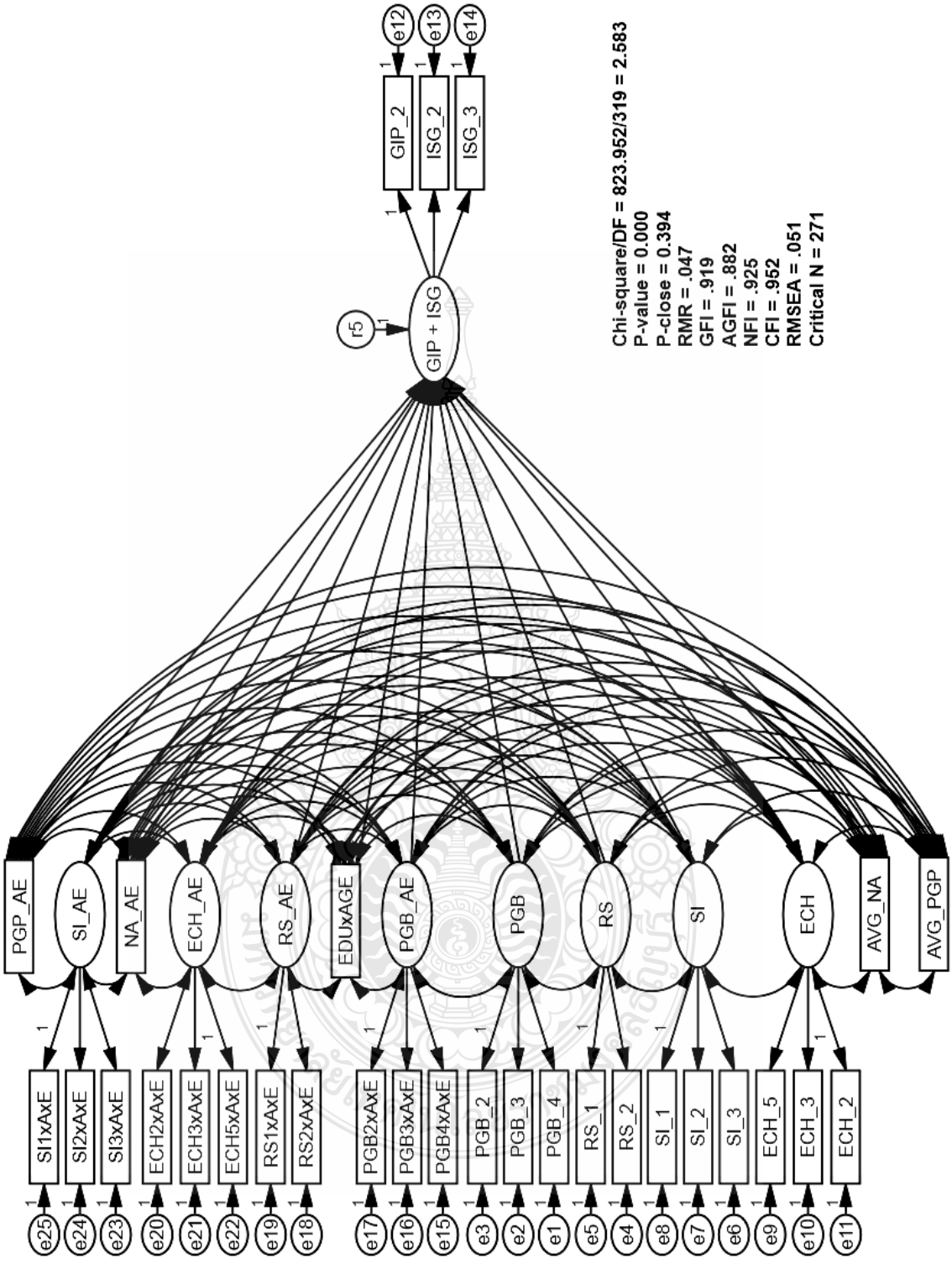


Figure 4.17 Structural model (age and education interacting)

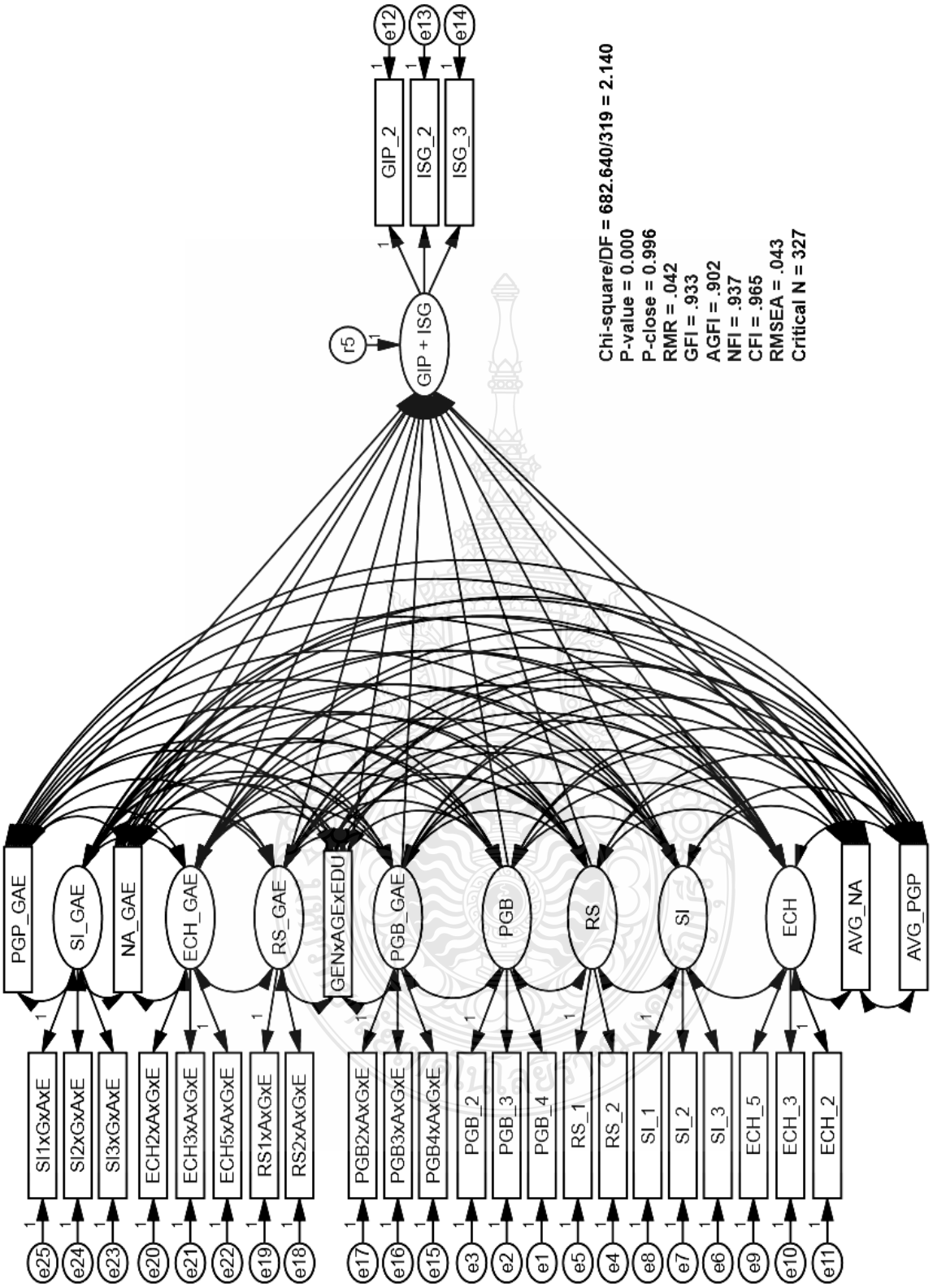
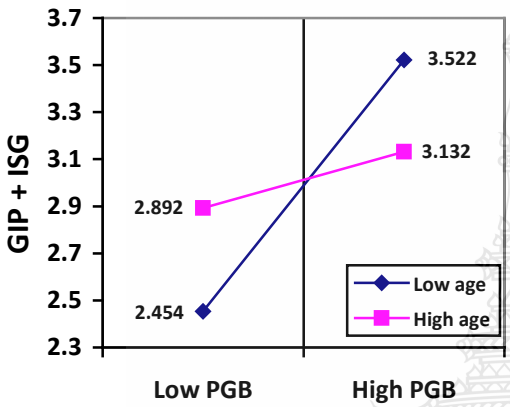


Figure 4.18 Structural model (all moderators interacting)

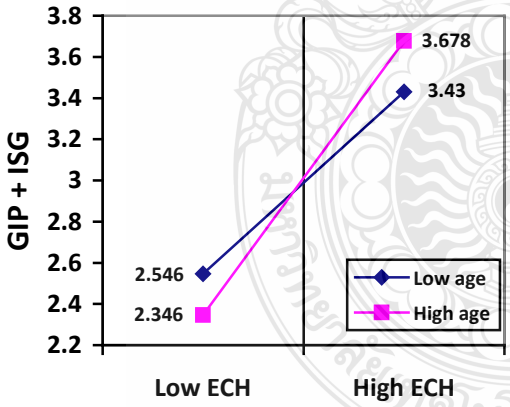
The below figures (4.19 to 4.23) are effect type analysis of all significant interactions (for more information about a tool, see Gaskins, 2016d). If an interaction resulted in insignificance ($p > .05$), it automatically says that there was no moderating effect. Plus, there is no need to be analyzed and plotted insignificant ones. 'Z' in unstandardized regression coefficients means standardized value.



Unstandardized Regression Coefficients:
GIP + ISG ← PGB = .327 (p = .000*)
GIP + ISG ← AGE = .012 (p = .587)
GIP + ISG ← ZPGB × ZAGE = -.207 (p = ***)

Result:
Age dampens the positive relationship between PGB and GIP + ISG

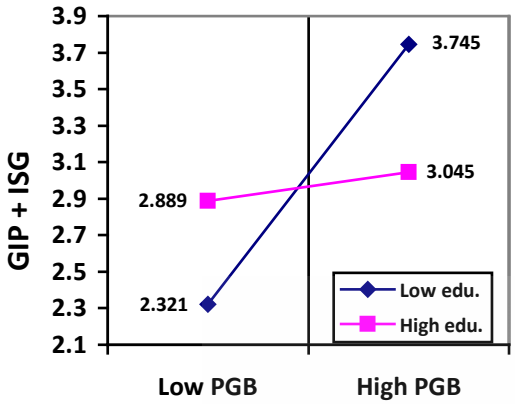
Figure 4.19 Perceived Green Benefit interacted with age



Unstandardized Regression Coefficients:
GIP + ISG ← ECH = .554 (p = .000*)
GIP + ISG ← AGE = .012 (p = .587)
GIP + ISG ← ZECH × ZAGE = .112 (p = .003)

Result:
Age strengthens the positive relationship between ECH and GIP + ISG

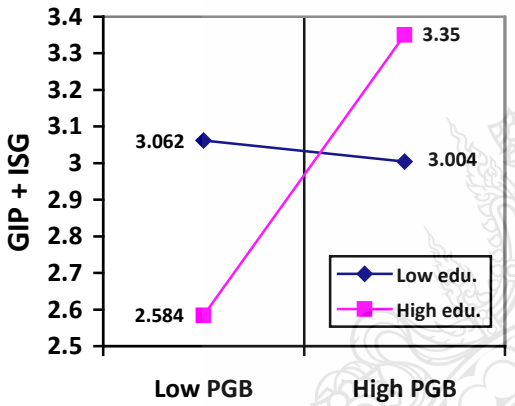
Figure 4.20 Environmental Concern & Habit interacted with age



Unstandardized Regression Coefficients:
GIP + ISG ← PGB = .395 (p = .000*)
GIP + ISG ← EDU = -.033 (p = .335)
GIP + ISG ← ZPGB × ZEDU = -.317 (p = ***)

Result:
Education dampens the positive relationship between PGB and GIP + ISG

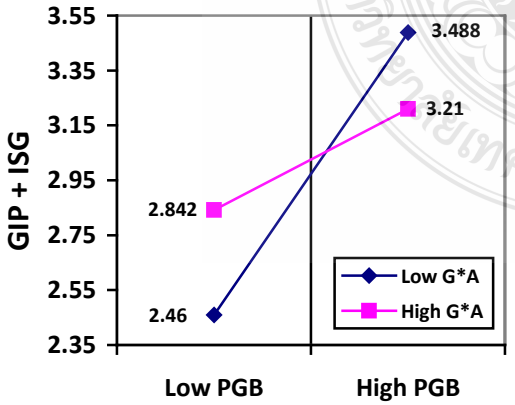
Figure 4.21 Perceived Green Benefit interacted with educational background



Unstandardized Regression Coefficients:
GIP + ISG ← RS = .177 (p = .013*)
GIP + ISG ← EDU = -.033 (p = .335)
GIP + ISG ← ZRS × ZEDU = .206 (p = .043)

Result:
Education strengthens the positive relationship between RS and GIP + ISG

Figure 4.22 Resource Sacrifice interacted with educational background



Unstandardized Regression Coefficients:
GIP + ISG ← PGB = .349 (p = .000*)
GIP + ISG ← GEN × AGE = .026 (p = .209)
GIP + ISG ← ZPGB × ZGEN × ZAGE = -.165 (p = .006)

Result:
Gender and age dampen the positive relationship between PGB and GIP + ISG

Figure 4.23 Perceived Green Benefit interacted with gender and age

Table 4.25 Summary of moderating factors between variables and GIP + ISG

Variable	Moderated correlation (p-value) and Direction						
	G	**A**	**E**	**G×A**	**G×E**	**A×E**	**G×A×E**
PGB	.008	-.207	-.317	-.165	.121	-.105	-.091
	(.916)	(.000*) D	(.000*) D	(.006*) D	(.143)	(.433)	(.069)
RS	-.104	.079	.206	.088	-.087	-.085	-.024
	(.160)	(.140)	(.013*) S	(.096)	(.349)	(.504)	(.632)
NA	.013	.002	-.007	.003	.030	.027	.013
	(.568)	(.933)	(.743)	(.907)	(.188)	(.245)	(.502)
SI	.055	-.034	-.020	.040	.012	.033	.028
	(.096)	(.333)	(.560)	(.272)	(.716)	(.297)	(.356)
ECH	.054	.112	.066	.041	-.055	.061	.042
	(.175)	(.003*) S	(.081)	(.271)	(.176)	(.064)	(.188)
PGP	-.018	.021	.031	-.015	-.012	.008	.024
	(.448)	(.377)	(.177)	(.517)	(.598)	(.701)	(.234)
Moderator β	-.016	.012	-.033	.026	.000	.013	.000
	(.718)	(.587)	(.335)	(.209)	(.981)	(.476)	(.991)

Acceptable significant level = < .05 (p = *)

G = Gender, A = Age, E = Educational experience, PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy

Table 4.25 is summary of relationships when interacting with moderators. The result shows that gender was not a good moderator as it was insignificant when positioned with the four other factors.

Age proved to be better than gender. Age compromised two relationships; PGB ← GIP + ISG and ECH ← GIP + ISG. This translates into two mechanisms: (1) senescence and green benefit recognition are flowing in the opposite direction; and (2) senescence makes people better acknowledge environmental issues.

Educational background also played a good moderator role. It moderated two relationships; PGB ← GIP + ISG and RS ← GIP + ISG. There were two results: (1) the higher the educational background, the lower the green benefit perception; but (2) the higher educational background encourages people to spend more for green products.

Gender alone was meaningless, but together with age, they can dampen a regression weight of PGB ← GIP + ISG. The result suggested that elder women do not believe in (or may not care about) the green benefit of IT. All results are displayed on the table 4.26

Table 4.26 Summary of path analysis of original model and moderated models

Model		Standardized regression weight						
		PGB	**RS**	**SI**	**ECH**	**NA**	**PGP**	**R^2**
Non-moderated		.316*	.155*	.056	.435*	.066*	.088*	.78
Moderated factor	Gender	.008	-.104	.055	.054	.013	-.018	.79
	Age	-.207*	.079	-.034	.112*	.022	.021	.80
	Education	-.317*	.206*	-.020	.066	-.007	.031	.81
	G × A	-.165*	.088	.040	.041	.003	-.015	.79
	G × E	.121	-.087	.012	-.055	.030	-.012	.79
	A × E	-.105	-.085	.033	.061	.027	.008	.80
	G × A × E	-.091	-.024	.028	.042	.013	.024	.79

Acceptable significant level = < .05 (p = *)

4.4.2 Hypothesis Judgment

This study carries five hypotheses as earlier mentioned in the first chapter. In this segment, the five hypotheses are judged and securitized. Those hypotheses are:

H1: Consumption Awareness (*Perceived Green Benefit*, *Resource Sacrifice* and *Noticeability*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Age*, *Gender* and *Educational Experience* as moderating factors.

H2: Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender*, *Age* and *Experience* as moderating factors.

H3: *Environmental Concern and Habit* has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender* and *Age* as moderating factors.

H4: *Green Intention in Purchasing or Using IT Product* has an influence on *Intention to Supporting Green Imaged Business*.

H5: *Perceived Green Organizational Policy* has an influence on *Green Intention in Purchasing or Using IT Product* and *Intention to Supporting Green Imaged Business*.

This study prefers to have three levels of hypothesis acceptance, as follows: 'Accepted' when all conditions are matched a hypothesis, 'Partially accepted' when at least one condition is matched a hypothesis and 'Rejected' when none of condition is matched a hypothesis.

There was a discriminant validity issue between GIP and ISG. Regarding this issue, there was a need to merge GIP and ISG together. This solution puts hypothesis 4 out of its relevance. Therefore, hypothesis 4 is rejected.

Hypothesis 1: Consumption Awareness (*Perceived Green Benefit*, *Resource Sacrifice* and *Noticeability*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Age*, *Gender* and *Educational Experience* as moderating factors.

The first hypothesis is **partially accepted** due to:

1. The positive impact from PGB to GIP + ISG was dampened by age (-.207, p = .000), educational experience (-.317, p = .000), and gender multiplied age (-.165, p = .006). All three moderating factors were in motion.
2. The positive impact from RS to GIP + ISG was strengthened by only educational experience (.206, p = .013).
3. The positive impact from NA to GIP + ISG has no moderating effect.

In brief, only PGB does have three moderating effects, but RS and NA do not.

Hypothesis 2: Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender*, *Age* and *Experience* as moderating factors.

The second hypothesis is **rejected** for the following reasons:

1. SI was not significant GIP + ISG on the non-moderated and moderating models.

Hypothesis 3: *Environmental Concern and Habit* has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender* and *Age* as moderating factors.

The third hypothesis is **partially accepted** as:

1. Only age amplified the relationship between ECH and GIP + ISG by .112 (p = .003).

Hypothesis 4: *Green Intention in Purchasing or Using IT Product* has an influence on *Intention to Support Green Imaged Business*.

Unfortunately, the fourth hypothesis is **rejected** according to the discriminant validity issue. However, GIP and ISG were found to be the same indicator as most respondents answered between 4 and 5 points. This possibly suggests that green intentions to purchase/use IT products and to support businesses are very similar. If consumers are 'greenetized' by green businesses, there is high likelihood of green shopping and vice versa.

Hypothesis 5: *Perceived Green Organizational Policy* has an influence on *Green Intention in Purchasing or Using IT Product* and *Intention to Support Green Imaged Business*.

The fifth hypothesis is **accepted** due to a reason:

1. PGP positively impacted on GIP + ISG with standardized regression weight at .088 (p = .004) on the non-moderated model.

Table 4.27 Summary of hypothesis judgment

	Hypothesis	Status
1	Consumption Awareness (*Perceived Green Benefit, Resource Sacrifice* and *Noticeability*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Age*, *Gender* and *Educational Experience* as moderating factors.	**Partially accepted** (Only PGB does have three moderating effects, but RS and NA do not.)
2	Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender*, *Age* and *Experience* as moderating factors.	**Rejected**
3	*Environmental Concern and Habit* has an influence on *Green Intention in Purchasing or Using IT Product* with *Gender* and *Age* as moderating factors.	**Partially accepted** (Only moderated by age)
4	*Green Intention in Purchasing or Using IT Product* has an influence on *Intention to Support Green Imaged Business*.	**Rejected** (discriminant validity issue)
5	*Perceived Green Organizational Policy* has an influence on *Green Intention in Purchasing or Using IT Product* and *Intention to Support Green Imaged Business*.	**Accepted** (GIP and ISG are merged)

PGB = Perceived Green Benefit, RS = Resource Sacrifice, NA = Noticeability,
GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green Business

4.4.3 Assumption of the rejection of the second hypothesis

It is an oddly contrast result of social influence between in this finding and theories. Many schools of thought suggested that society should be determined technological acceptance/adoption of an individual (more or less). The different in a study subject may lay an opposite result. As discourse earlier, a green IT product is phantasy in consumers' sight. Nonetheless, descriptive statistical comparison between demographical differentiations, such as gender, might show some traces.

Table 4.28 Descriptive statistical result of *Social Influence* (SI)

Group		**Level of significant (Average)**					**x̄**	**S.D.**
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Gender	Male	25 (8.4%)	36 (12.1%)	101 (33.9%)	105 (35.2%)	31 (10.4%)	3.272	1.075
	Female	16 (5.0%)	36 (11.3%)	94 (29.4%)	134 (41.9%)	40 (12.5%)	3.456	1.013

Table 4.29 Descriptive statistical result of GIP + ISG

Group		**Level of significant (Average)**					**x̄**	**S.D.**
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Gender	Male	5 (1.7%)	11 (3.7%)	26 (8.7%)	129 (43.3%)	127 (42.6%)	4.215	.8767
	Female	5 (1.6%)	5 (1.6%)	26 (8.1%)	152 (47.5%)	132 (47.3%)	4.253	.7967

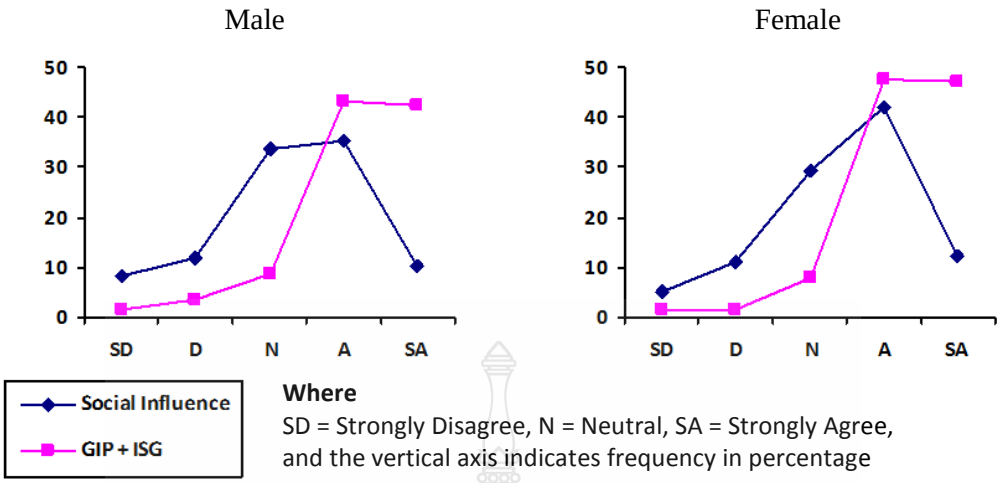


Figure 4.24 SI and GIP + ISG compare by gender

Different means (△x□) between SI and GIP + ISG of male respondents is 0.943, and female is 0.797. With respect to the two △x□ and slopes in the charts, it is assumable that there is higher possibility for women to be affected by social norm than men as discovered by Vandervoort's (2000) about social isolation.

4.4.4 Assumption of the negative moderating effects of PGB

The other curiosity is regressive moderating effects of Perceived Green Benefit (PGB). Common believing is the older age and the higher education degree should equal the better acknowledgement of green IT benefit. The outcome is negative; when age and education level are ran forward, the perception of green IT advantage is reversed. There should be a tincture when descriptive statistical outcomes (PGB and GIP + ISG) are compared. Table 4.30 is the comparison by age.

Table 4.30 Descriptive statistical result of Perceived Green Benefit (PGB)

Group		Level of significant (Average)					x̄	S.D.
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Age	< 20	1 (1.6%)	8 (13.1%)	10 (16.4%)	24 (39.3%)	18 (29.5%)	3.820	1.057
	20 - 30	1 (0.4%)	14 (5.3%)	34 (12.8%)	133 (50.0%)	84 (31.6%)	4.071	.8279
	31 - 40	0	5 (3.4%)	17 (11.6%)	66 (44.9%)	59 (40.1%)	4.218	.7809
	41 - 50	1 (1.1%)	6 (6.3%)	8 (8.4%)	38 (40.0%)	42 (44.2%)	4.200	.9179
	> 50	0	2 (4.1%)	8 (16.3%)	17 (34.7%)	22 (44.9%)	4.204	.8655

Table 4.31 Descriptive statistical result of GIP + ISG

Group		Level of significant (Average)					x̄	S.D.
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
Age	< 20	3 (4.9%)	4 (6.6%)	3 (4.9%)	36 (59.0%)	15 (24.6%)	3.918	1.005
	20 - 30	4 (1.5%)	7 (2.6%)	22 (8.3%)	129 (48.5%)	104 (39.1%)	4.211	.8201
	31 - 40	1 (0.7%)	2 (1.4%)	13 (8.8%)	67 (45.6%)	64 (43.5%)	4.299	.7441
	41 - 50	1 (1.1%)	3 (3.2%)	8 (8.4%)	31 (32.6%)	52 (54.7%)	4.368	.8512
	> 50	1 (2.0%)	0	6 (12.2%)	18 (36.7%)	24 (49.0%)	4.306	.8466

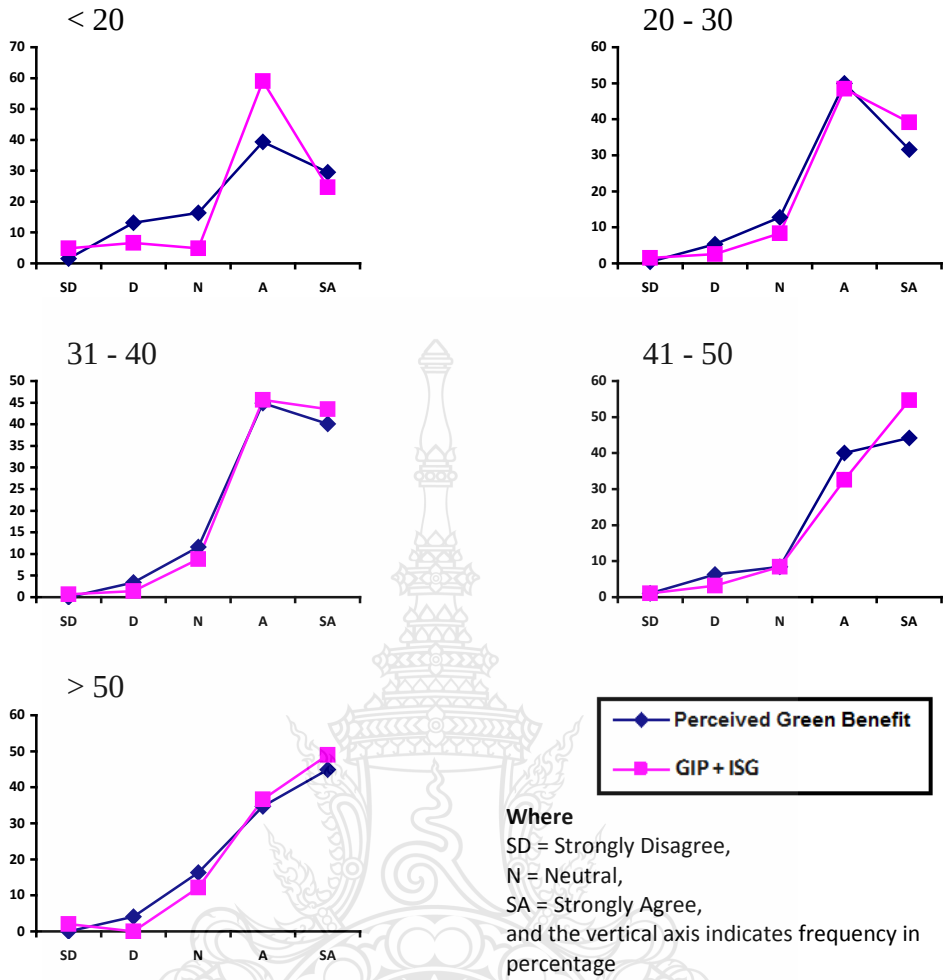


Figure 4.25 PGB and GIP + ISG compare by age

The sharp peak was decreasing and the plotted line was sloping while age was increasing. Notwithstanding, these two phenomenon could not be used as a vestige of the regressive interaction effects due to a lack of literature support. Thus, social beliefs are used to explain the reverse effects.

For age, the first simple thought is senescence (and senility) causes mental and physic performances to be degraded. It is also our decrease of technological recognition. The next thought is quite opposite; older people have less confidence in many things. For example, the younger the person means the more intention to use a brand new railway in northern Sweden (Nordlund and Westin, 2013). As a consequence, a distance between elders and IT becomes farther.

The strange result of moderation of education background can be understood. The higher education degree translates to the more complicate thinking. In other words, they do not trust something easily. For example, an individual skepticism and educational level usually increase together, especially about supernatural belief (Hill, 2011).

An investigation of the two hypotheses rejection is highly recommended. Perhaps an upcoming demographical separation differ outcomes. These are ones of inspirations of multiple group analysis.

4.4.5 Result Enlargement

This section is conducted to gain additional information for result explanations. The extension part scrutinization started with multiple group analysis. This study uses model fit indices where all are estimated simultaneously as suggested by Gaskin (2016e). The first analysis is a gender comparison (figure 4.26 and 4.27). Table 4.32 shown results of Chi-square different test between genders.

Table 4.32 Chi-square different test between genders

Relationship	Parameter constraint	Chi-square	df	P	Invariant?
GIP + ISG ← PGB	b1_1=b1_2	.170	1	.680	Yes
GIP + ISG ← RS	b2_1=b2_2	2.985	1	.084	No
GIP + ISG ← SI	b3_1=b3_2	3.267	1	.071	No
GIP + ISG ← ECH	b4_1=b4_2	1.844	1	.174	Yes
GIP + ISG ← NA	b5_1=b5_2	.530	1	.467	Yes
GIP + ISG ← PGP	b6_1=b6_2	.608	1	.436	Yes

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green business

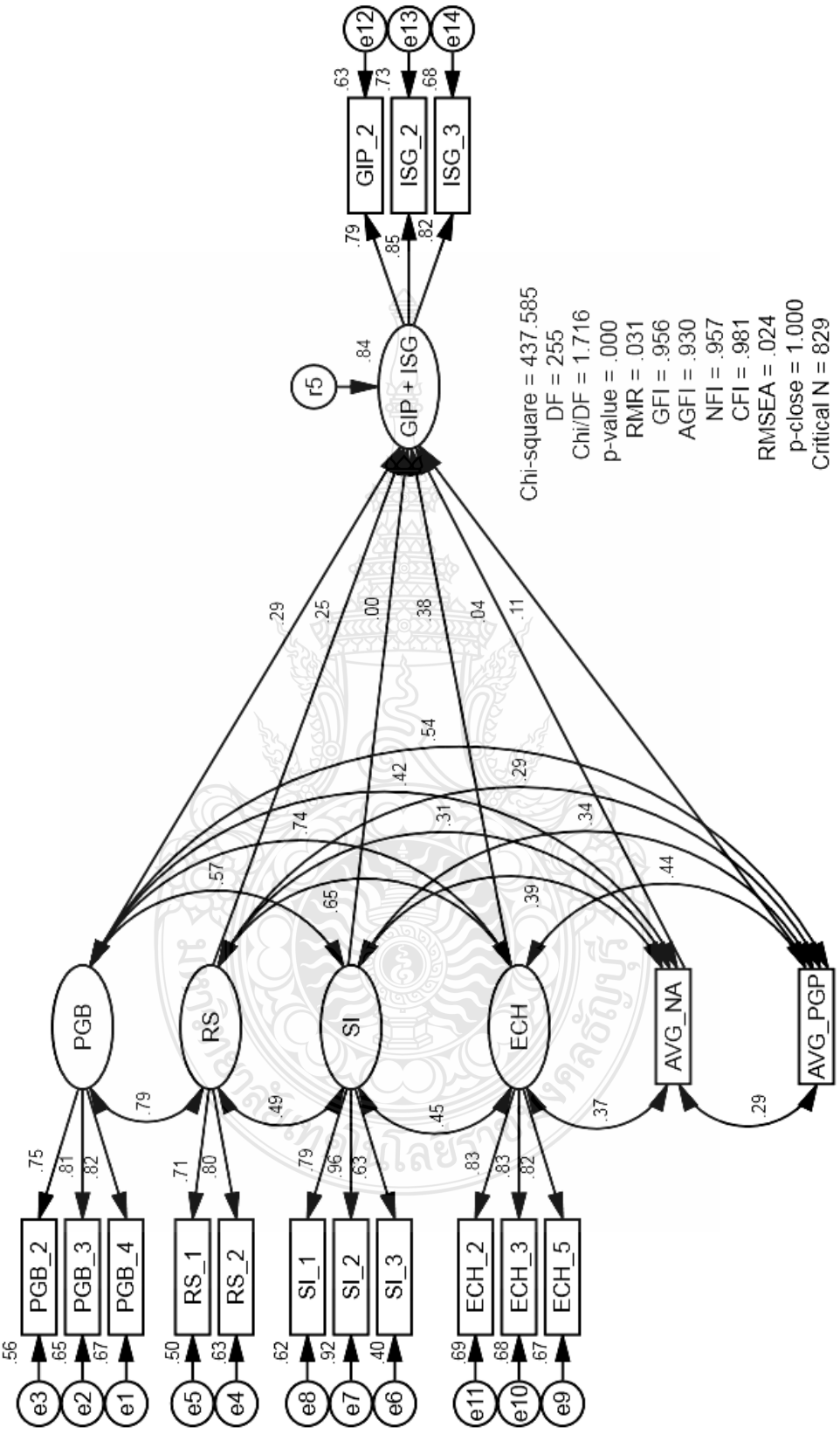


Figure 4.26 Standardized structural model (male)

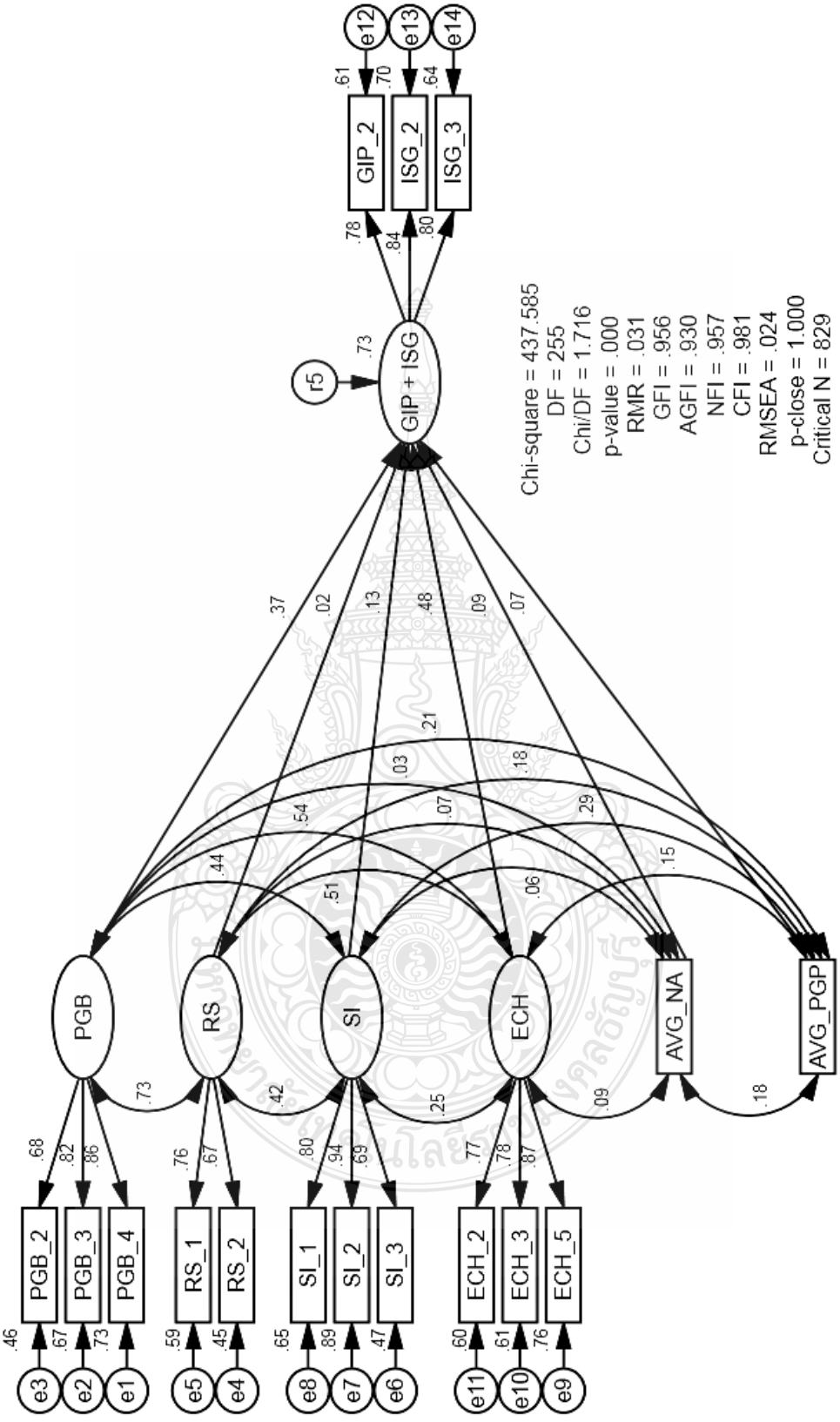


Figure 4.27 Standardized structural model (female)

Table 4.33 Result of multiple group analysis (Gender comparison)

Group	Variable	Regression Weights				Standardized Regression Weight (β)	R^2
		Est.	S.E.	C.R.	p		
Male	GIP + ISG ← PGB	.340	.141	2.405	.016*	.290	.84
	GIP + ISG ← RS	.231	.091	2.527	.012*	.254	
	GIP + ISG ← SI	-.002	.040	-.051	.959	-.002	
	GIP + ISG ← ECH	.432	.079	5.443	.000*	.384	
	GIP + ISG ← NA	.046	.046	1.000	.317	.041	
	GIP + ISG ← PGP	.108	.047	2.293	.022*	.114	
Female	GIP + ISG ← PGB	.411	.100	4.116	.000*	.368	.73
	GIP + ISG ← RS	.022	.080	.276	.783	.025	
	GIP + ISG ← SI	.100	.039	2.561	.010*	.130	
	GIP + ISG ← ECH	.589	.078	7.509	.000*	.478	
	GIP + ISG ← NA	.092	.042	2.190	.029*	.090	
	GIP + ISG ← PGP	.061	.036	1.685	.092	.073	

Acceptable significant level = < .05 (p = *),
PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green business

Chi-square differential test can explain the difference between male and female. The result manifests the dissimilarity in RS and SI between genders. In according with table 4.32, path (1) GIP + ISG ← RS and (2) GIP + ISG ← SI are invariant. (1) GIP + ISG ← RS: Male respondents have regression weight at .254 with significant level at .012, but women showed nothing significant. This implies that men have more propensities for green IT products rather than women. (2) GIP + ISG ← SI: Male responders show nothing significant on this path, but female answerers have

regression weight at .130 with significant level at .010. Women are more sociable than men (Vandervoort, 2000); friends, family and co-workers account for similar restraints for female consumers.

Sometimes the chi-square difference test is only to spot big diversions, but ignore tiny dissimilarities. Table 4.32 shows that there was no contrast between the genders on GIP + ISG ← NA and GIP + ISG ← PGP, but table 4.33 provided something else. Path GIP + ISG ← NA was significant only for women (β = .90, p = .029), but GIP + ISG ← PGP was significant only for men (β = .114, p = .022). Men are good at workplace atmosphere observation, but women are good at product label cogitation. The next section is an age comparison.

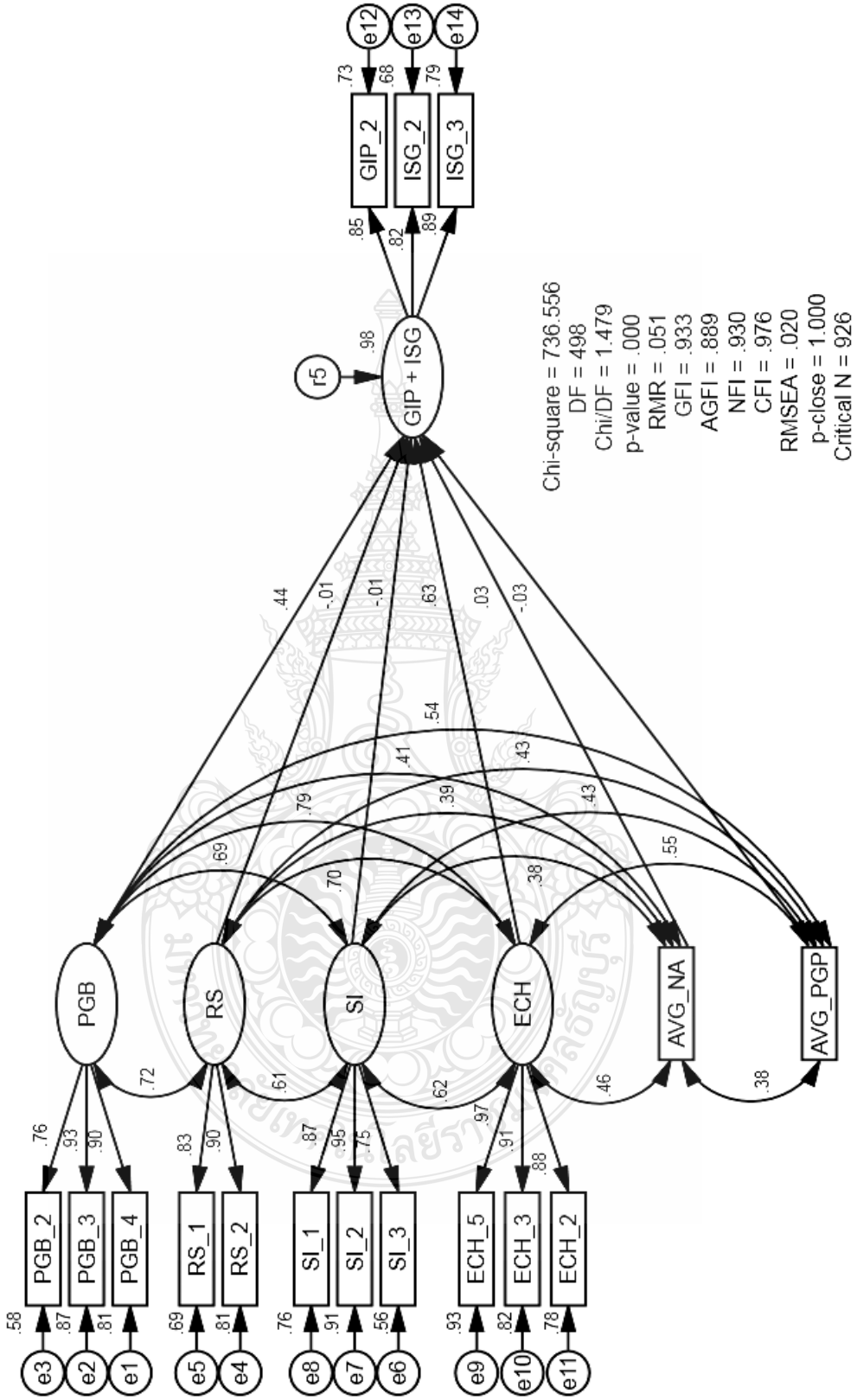


Figure 4.28 Standardized structural model (Age under 20)

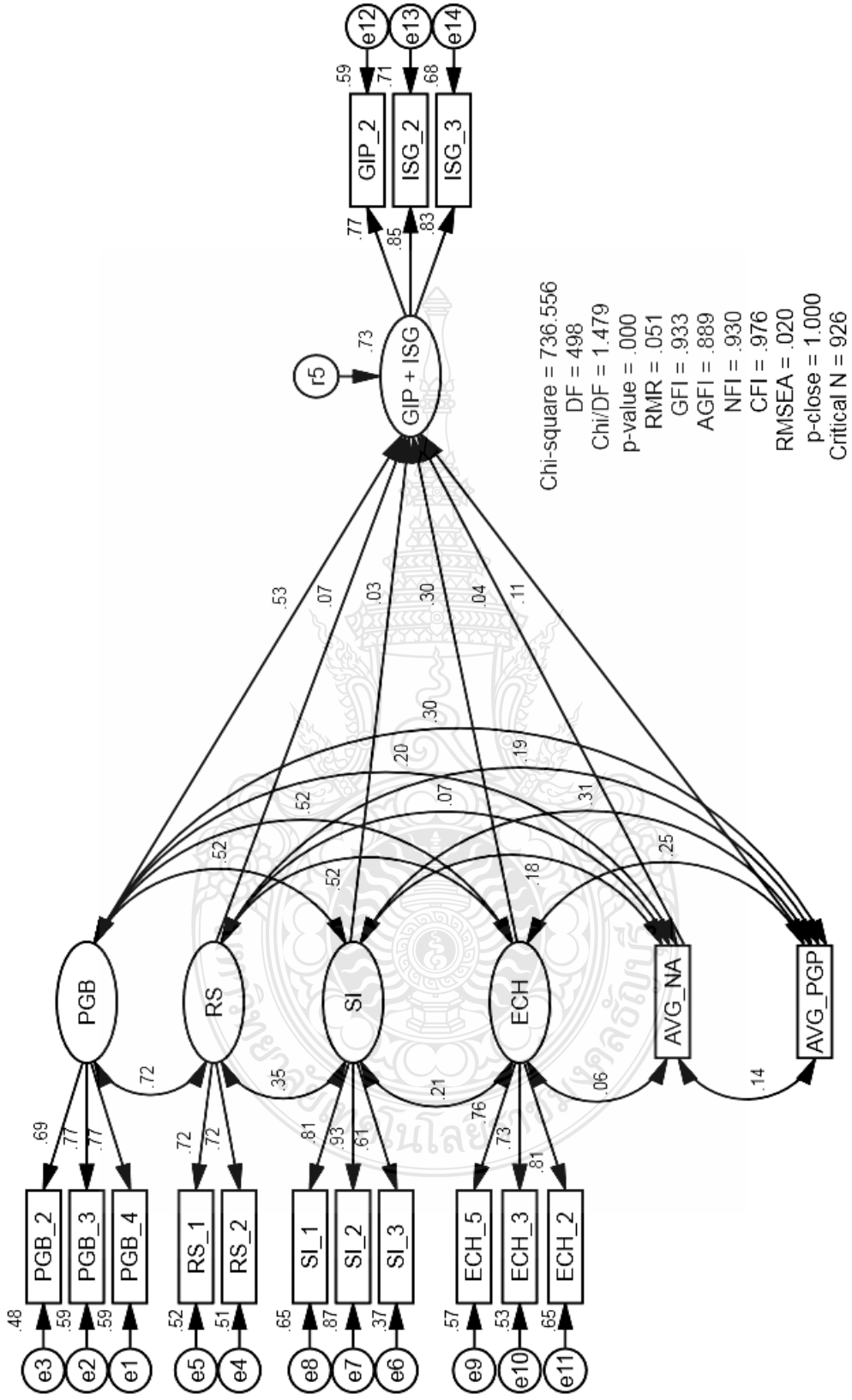


Figure 4.29 Standardized structural model (Age 20-30)

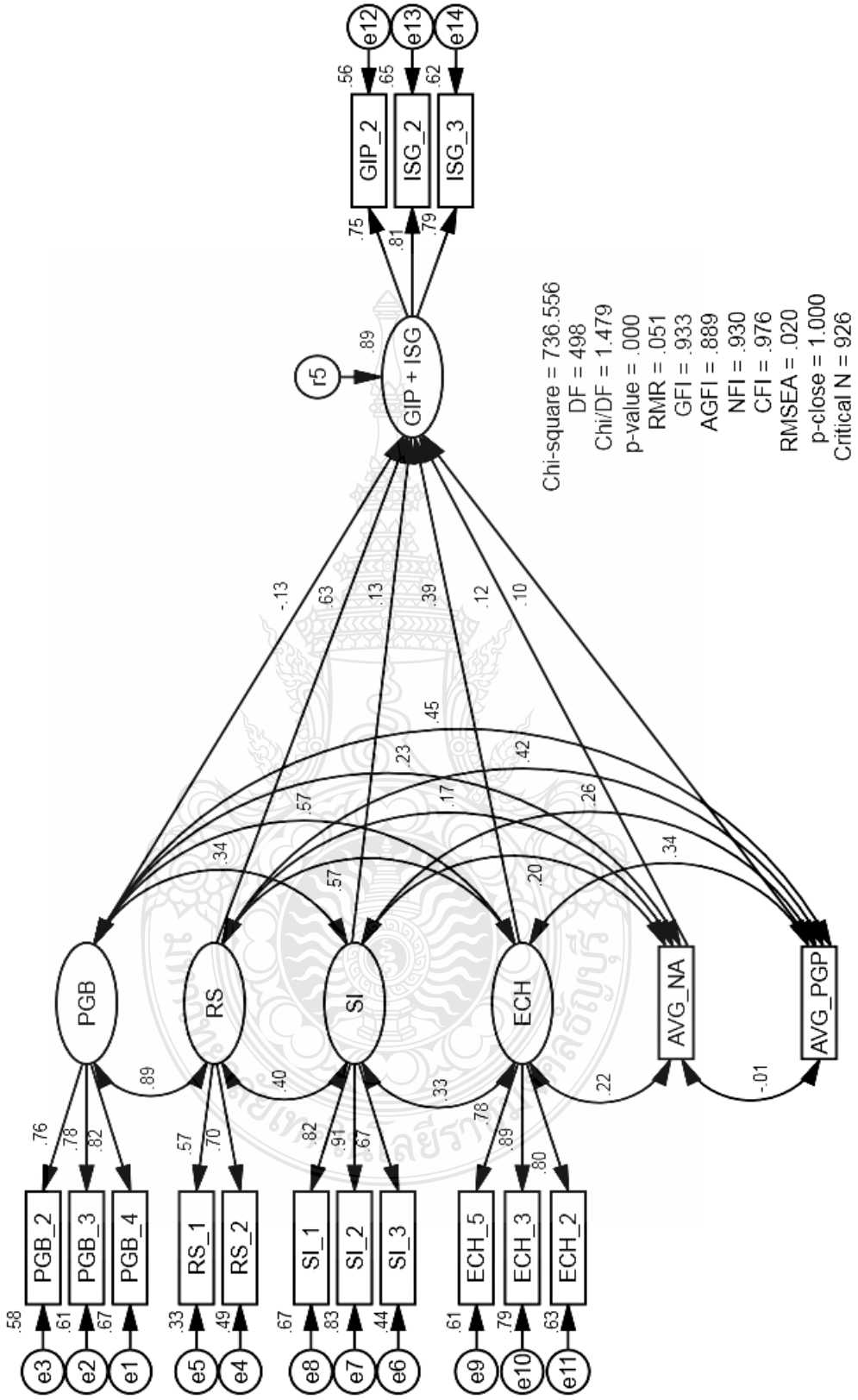


Figure 4.30 Standardized structural model (Age 31-40)

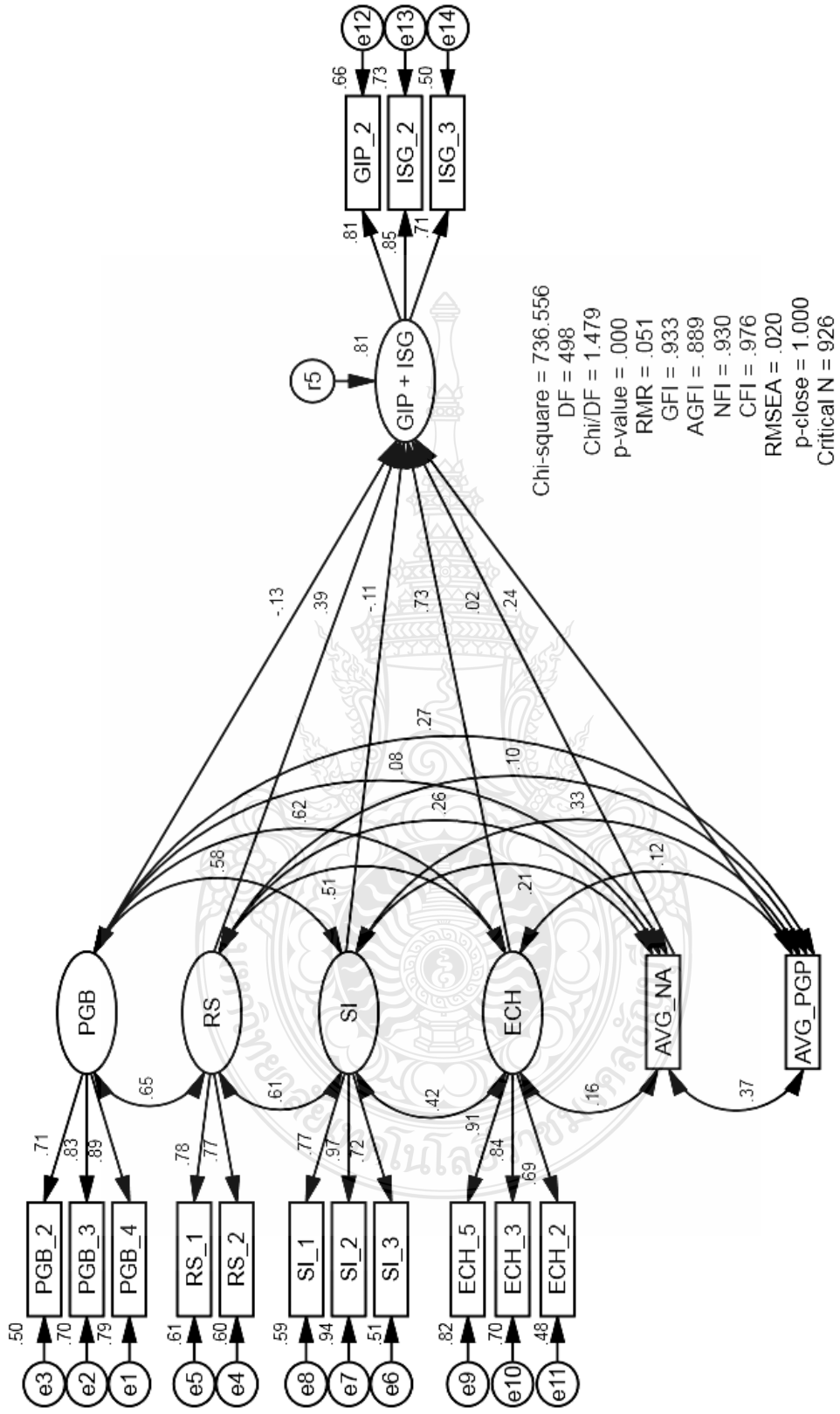


Figure 4.31 Standardized structural model (Age 41-50)

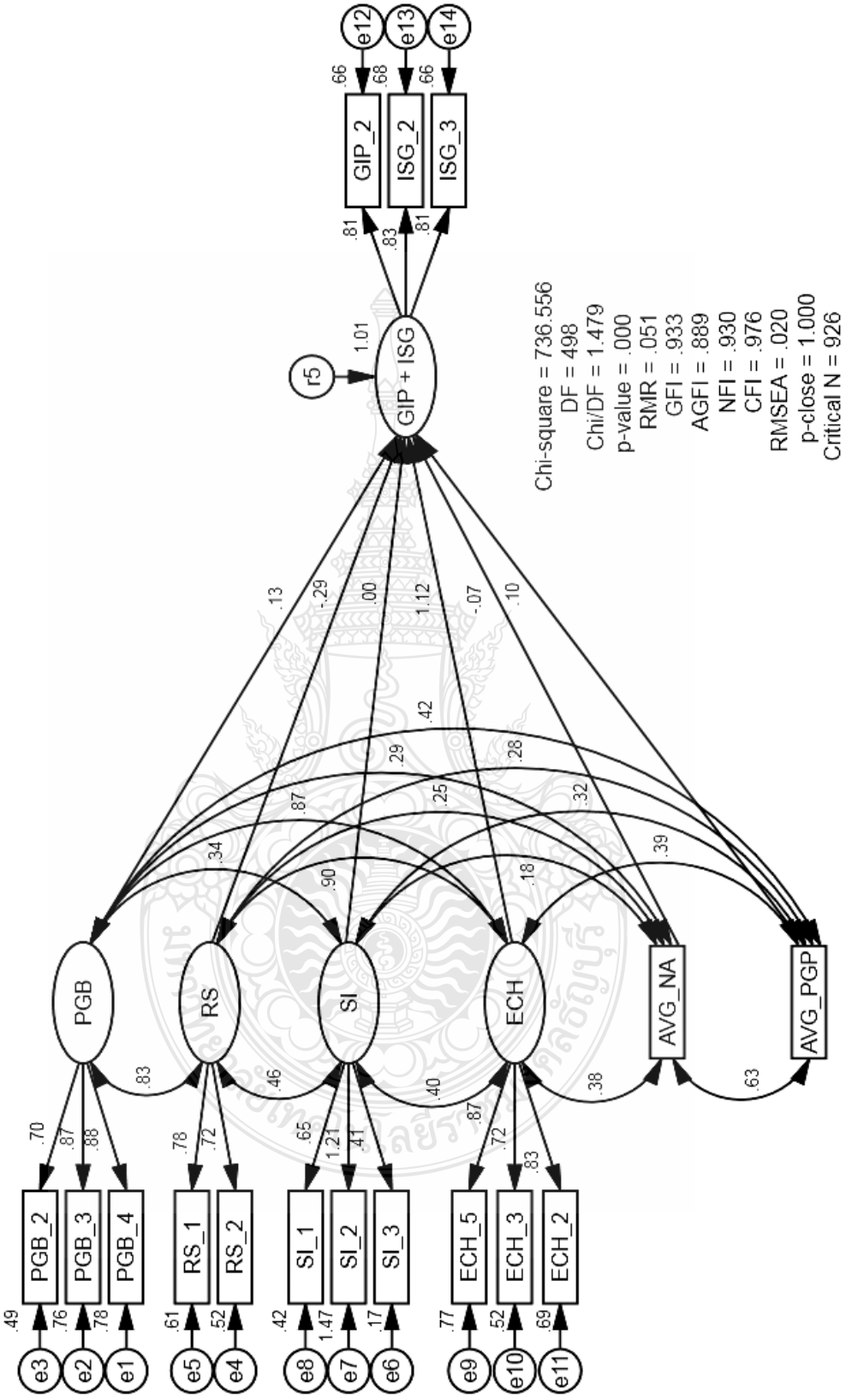


Figure 4.32 Standardized structural model (Age over 50)

Figure 4.32 shows that 49 respondents were not enough to perform regression analysis. R^2 and regression weight (beta) should be somewhere between 0 and 1, but they were higher than 1. Combining two respondent groups (age 41-50, and over 50) will reduce the problem. Figure 4.33 is new diagram of 'Age older than 40' group. Table 4.34 shows comparison of structural models in regard of respondent's age.

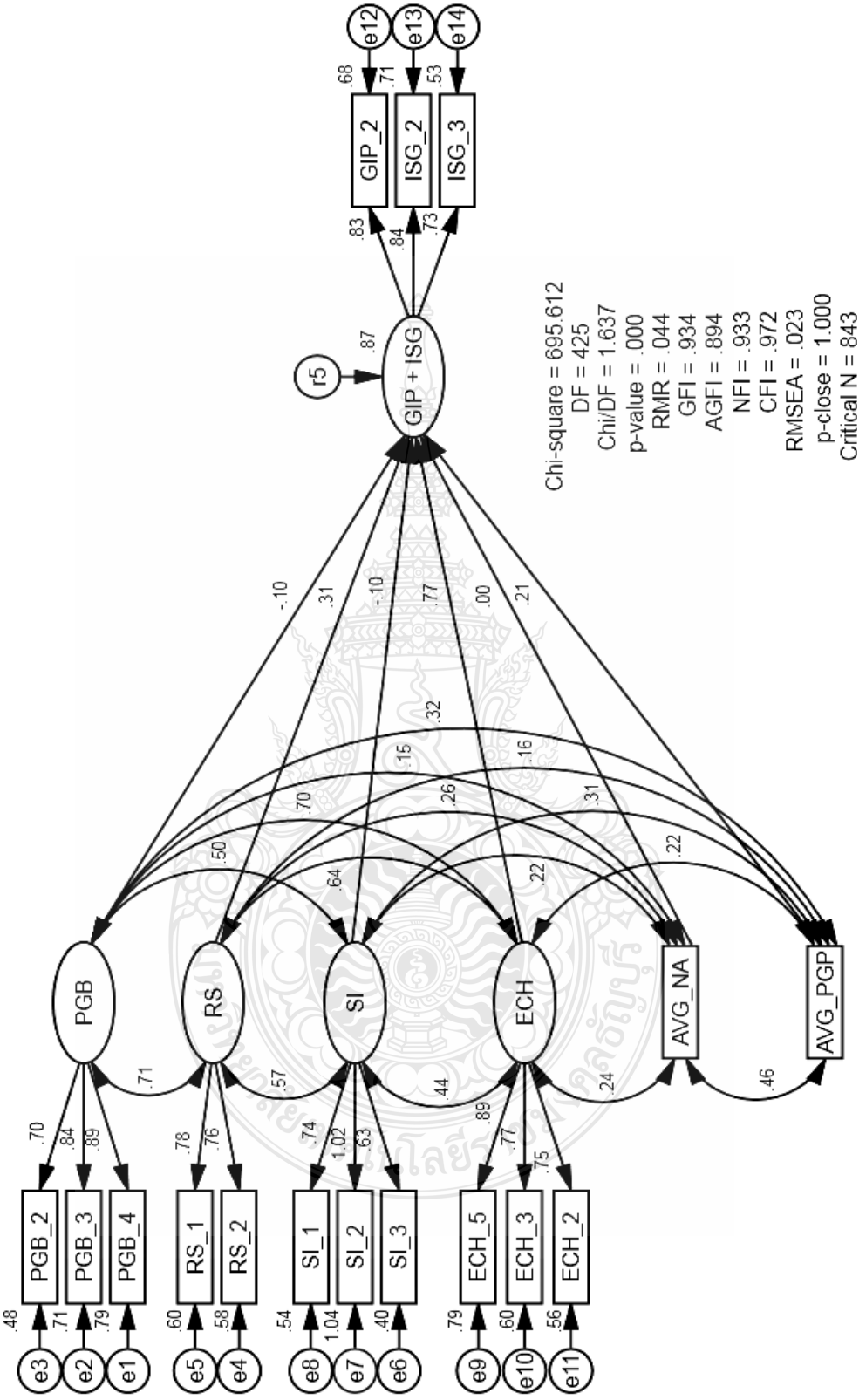


Figure 4.33 Standardized structural model (Age over 40)

Table 4.34 Result of multiple group analysis (Age comparison)

Group	Variable	Regression Weights				Standardized Regression Weight (β)	R^2
		Est.	S.E.	C.R.	p		
Younger than 20	GIP + ISG ← PGB	.561	.171	3.290	.001*	.438	.98
	GIP + ISG ← RS	-.011	.089	-.126	.900	-.012	
	GIP + ISG ← SI	-.008	.077	-.103	.918	-.009	
	GIP + ISG ← ECH	.630	.123	5.130	.000*	.625	
	GIP + ISG ← NA	.046	.093	.495	.620	.031	
	GIP + ISG ← PGP	-.034	.076	-.449	.654	-.030	
20-30	GIP + ISG ← PGB	.604	.138	4.367	.000*	.531	.73
	GIP + ISG ← RS	.068	.097	.702	.483	.073	
	GIP + ISG ← SI	.024	.050	.483	.629	.030	
	GIP + ISG ← ECH	.346	.080	4.328	.000*	.303	
	GIP + ISG ← NA	.042	.050	.846	.397	.040	
	GIP + ISG ← PGP	.100	.045	2.217	.027*	.109	
31-40	GIP + ISG ← PGB	-.129	.443	-.292	.770	-.130	.89
	GIP + ISG ← RS	.607	.486	1.248	.212	.632	
	GIP + ISG ← SI	.077	.058	1.327	.185	.126	
	GIP + ISG ← ECH	.420	.112	3.757	.000*	.390	
	GIP + ISG ← NA	.105	.067	1.570	.116	.123	
	GIP + ISG ← PGP	.075	.059	1.274	.203	.099	
Older than 40	GIP + ISG ← PGB	-.127	.158	-.801	.423	-.101	.87
	GIP + ISG ← RS	.279	.123	2.265	.024*	.306	
	GIP + ISG ← SI	-.097	.068	-1.434	.152	-.104	
	GIP + ISG ← ECH	1.163	.182	6.382	.000*	.775	
	GIP + ISG ← NA	.000	.076	.003	.998	.000	
	GIP + ISG ← PGP	.183	.065	2.839	.005*	.206	

Acceptable significant level = < .05 (p = *),

Differentiation among the ages was as a result of the information in table 4.34. Juveniles (younger than 20) acknowledge advantages of environmental friendliness (PGB; β = .438, p = .001) and environmental problems (ECH; β = .625, p = .000). There is no significant value on RS, SI, NA, and PGP paths. It is understandable that many people who are younger than 20 have zero work experience. Accordingly, PGP has null effect in this group. Financial issues were insignificant in the RS path. NA has no effect as well, which means teenagers lack knowledge of eco-labels. Social sphere also has no effect on green IT product persuasion.

Those in ages 20 and 30 are of working age and more socially engaged. PGP becomes significant in the prediction (β = .109, p = .027), which means that workplace atmosphere starts to impact the human brain. Value of PGB is strengthened (β = .531, p = .000), but ECH is dampened (β = .303, p = .000). RS, SI, and NA still had shown insignificance.

Surprisingly, PGP turned insignificant for 31 to 40-year-olds. People may get exhausted and bored of a workplace. PGB also turned insignificant; this implies that busy lives caused older adults belief (about green product) to change downward. For this group, ECH was the only variable that carries a good significant level (β = .390, p = .000).

Respondents, who are older than 40, show a very interesting dissimilar results. The RS remained insignificant until people approached 41 (β = .306*), ECH became stronger (β = .775, p = .000), and also PGP (β = .206, p = .005). This suggests that older people are very concerned about the environmental situation. Conservation of the environment equals their survival and fitness, elders believed. Therefore, spending money on green products poses no problem. When reaching 41 years old, people as employees may have to keep their good image in a workplace. That may answer how PGP became stronger when we passed 40.

The same issue also occurred in multiple group analysis with categorizing by educational experience. The highest educational background group (higher than master's degree) has only 14 respondents. This lack of sample size will generate R^2 and regression weight (beta) surpasses 1. Thus, 'Master's degree' (14) and 'higher than

Master's degree' (112) should be counted together. New popularity of two-group combination is 126.

Running multi-group analysis by separating educational experience resulted in negative variances. A statistical application suggested that there was still not enough population despite the combining the two groups. Regarding the triangular number equation (see equation 4.4 and 4.5 on page 130), although the two groups are united, ten more respondents were necessary.

This study retrieved additional 16 completed questionnaires; 10 from master's degree graduate respondents, 5 from master's degree candidates, and 1 was removed due to missing data. Upon receipt of which, a statistical application allowed the data to be examined. From figure 4.34 to figure 4.36 are an educational background comparison.

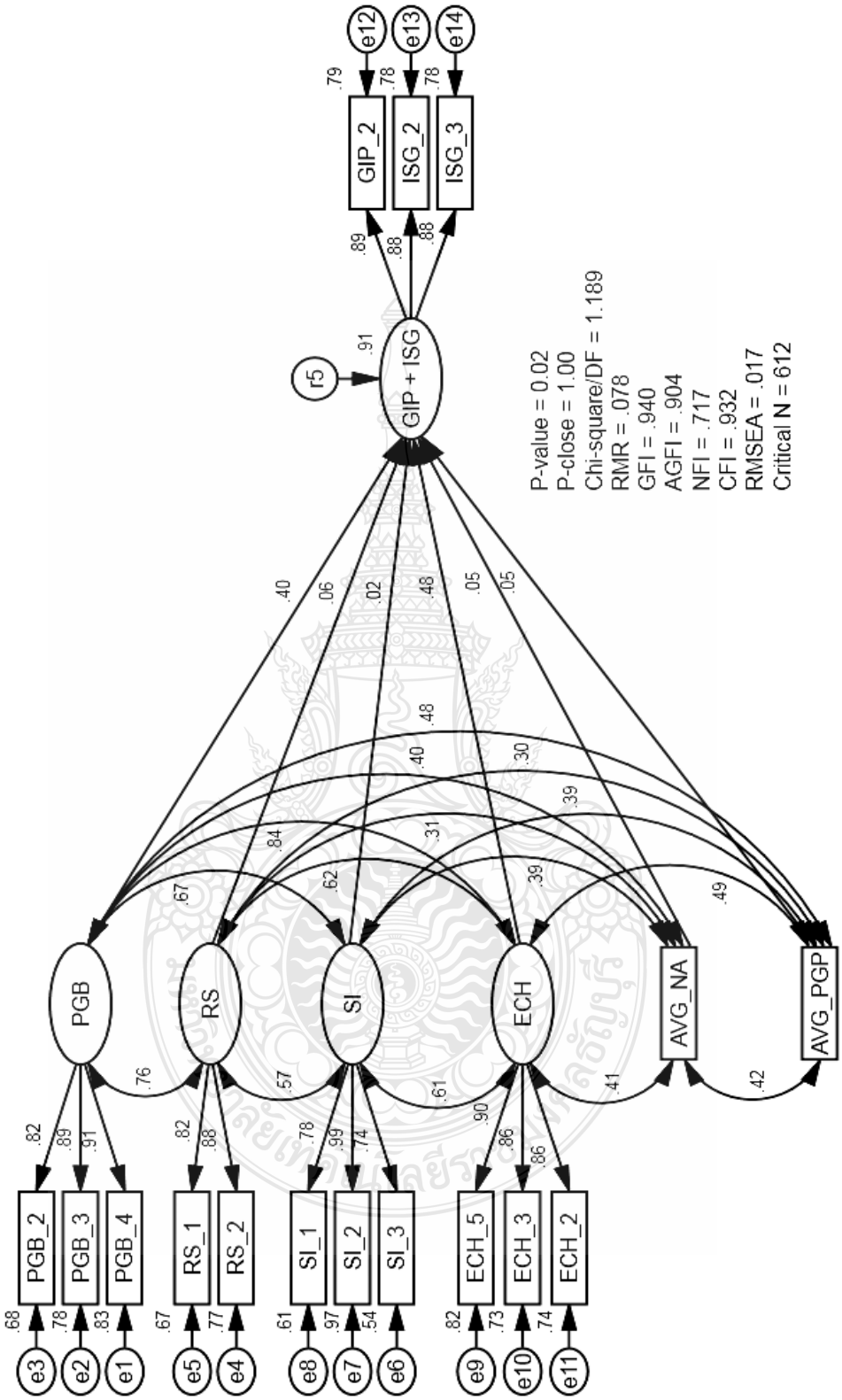


Figure 4.34 Standardized structural model (lower than bachelor's degree)

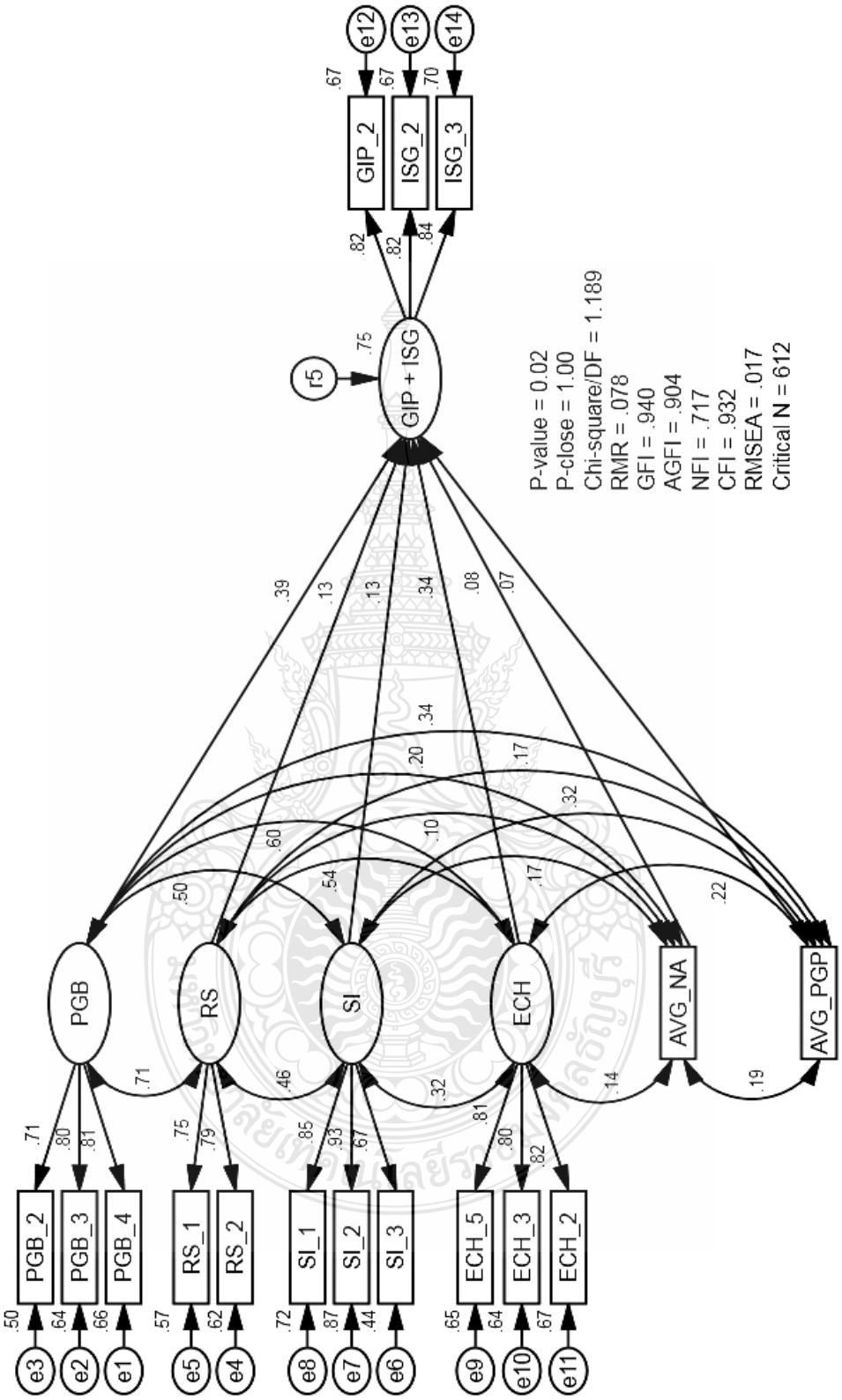


Figure 4.35 Standardized structural model (bachelor's degree or equal)

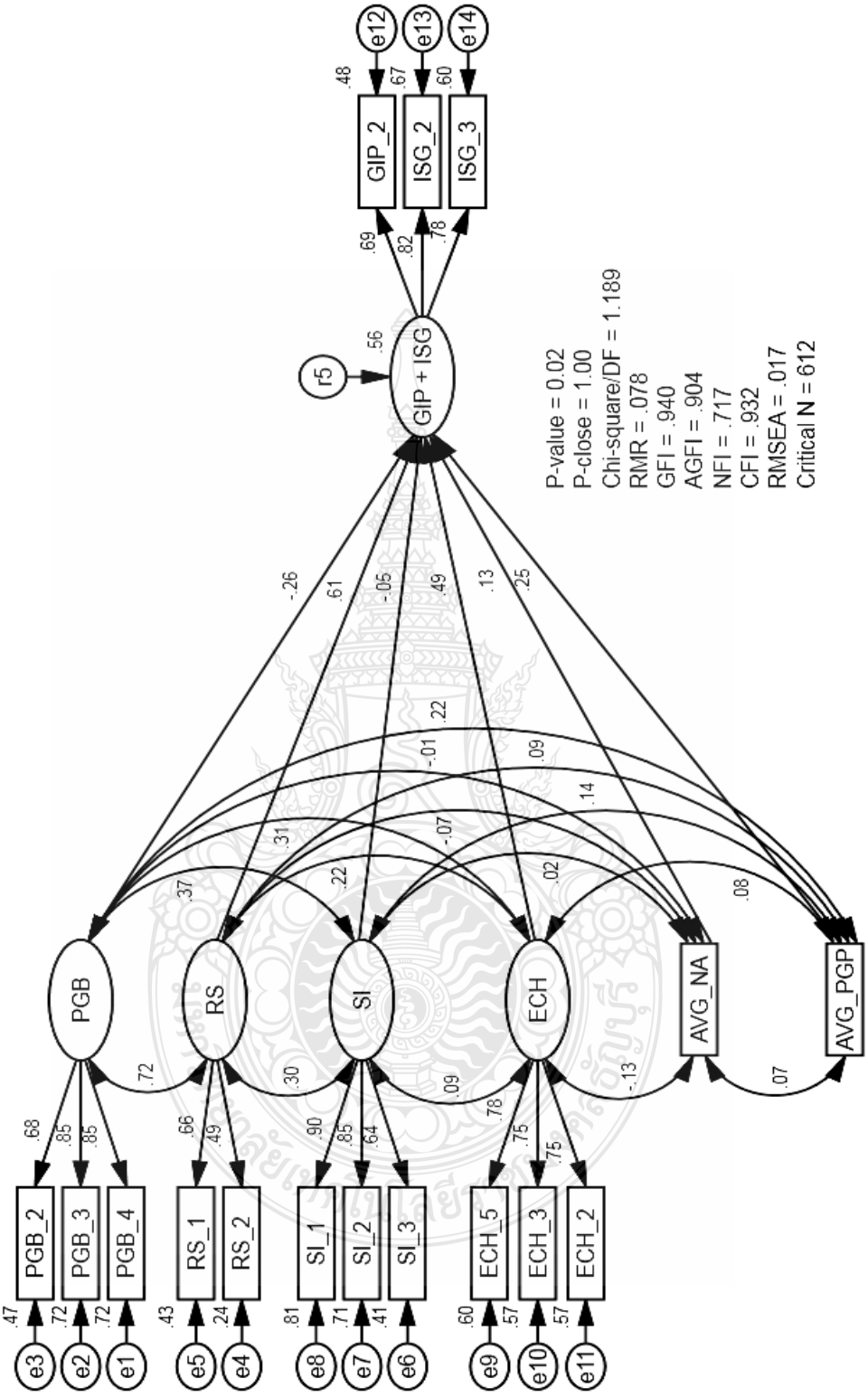


Figure 4.36 Standardized structural model (higher than bachelor's degree)

Table 4.35 Result of multiple group analysis (Educational comparison)

Group	Variable	Regression Weights				Std. Regression Weight (β)	R^2
		Est.	S.E.	C.R.	p		
Lower than bachelor's degree	GIP + ISG ← PGB	.511	.180	2.833	.005*	.403	.91
	GIP + ISG ← RS	.058	.089	.655	.513	.057	
	GIP + ISG ← SI	.027	.073	.373	.709	.023	
	GIP + ISG ← ECH	.631	.144	4.387	.000*	.485	
	GIP + ISG ← NA	.073	.072	1.024	.306	.050	
	GIP + ISG ← PGP	.052	.060	.860	.390	.045	
Bachelor's degree or equal	GIP + ISG ← PGB	.442	.102	4.339	.000*	.386	.75
	GIP + ISG ← RS	.117	.070	1.681	.093	.093	
	GIP + ISG ← SI	.093	.037	2.514	.012*	.125	
	GIP + ISG ← ECH	.398	.070	5.714	.000*	.341	
	GIP + ISG ← NA	.079	.041	1.912	.056	.075	
	GIP + ISG ← PGP	.065	.038	1.691	.091	.073	
Higher than bachelor's degree	GIP + ISG ← PGB	-.241	.265	-.912	.362	-.262	.56
	GIP + ISG ← RS	.551	.303	1.685	.092	.608	
	GIP + ISG ← SI	-.023	.056	-.402	.687	-.045	
	GIP + ISG ← ECH	.578	.159	3.628	.000*	.489	
	GIP + ISG ← NA	.101	.075	1.342	.180	.130	
	GIP + ISG ← PGP	.185	.080	2.326	.020*	.251	

Acceptable significant level = < .05 (p = *),

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence, ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product, ISG = Intention to Support Green business

This outcome indicates; an individual belief in advantages of green IT product becomes lower once he/she reaches a higher educational level. As can be seen in table 4.36, respondents in the first class carried stronger PGB (β = .403, p = .005) rather than the bachelor's degree group (PGB, β = .386, p = .000).

For social impact, it is clearly that only participants who have bachelor's degree are affected by surrounding people in regard to green IT persuasion. Although the SI was significant, its effect was not so strong (β = .125, p = .012). Perhaps, people, who are graduated lower or higher than bachelor's degree, are more isolated than bachelor's degree graduators.

Environmental common senses, or ECH, acted as a protagonist in this story. ECH has shown high significant levels in every sub-model and also in this model. The higher than bachelor's degree group have the highest score on ECH (β = .489, p = .000), followed by the lower than bachelor's degree group (β = .485, p = .000), and the bachelor's degree or equal group (β = .341, p = .000).

Only the higher than bachelor's degree group have PGP effect at a satisfactory level (β = .251, p = .020). This alludes that the higher educational background means higher involvement in organizational policies. Nonetheless, the R^2 of the higher than bachelor's degree group was .56, which is only 56 percent that can be predicted.

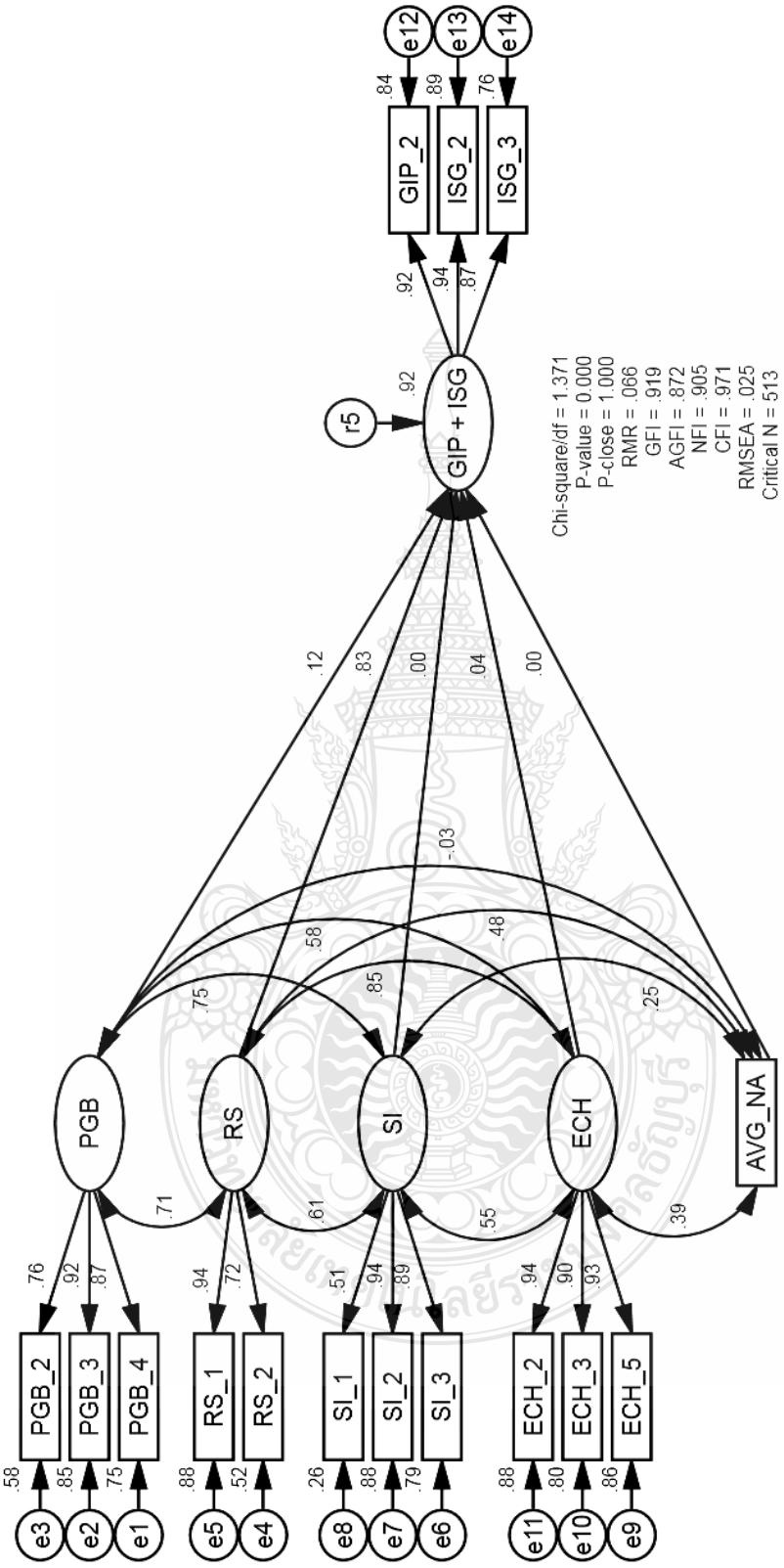


Figure 4.37 Standardized structural model (PGP = 2/5; Semi-green workplace)

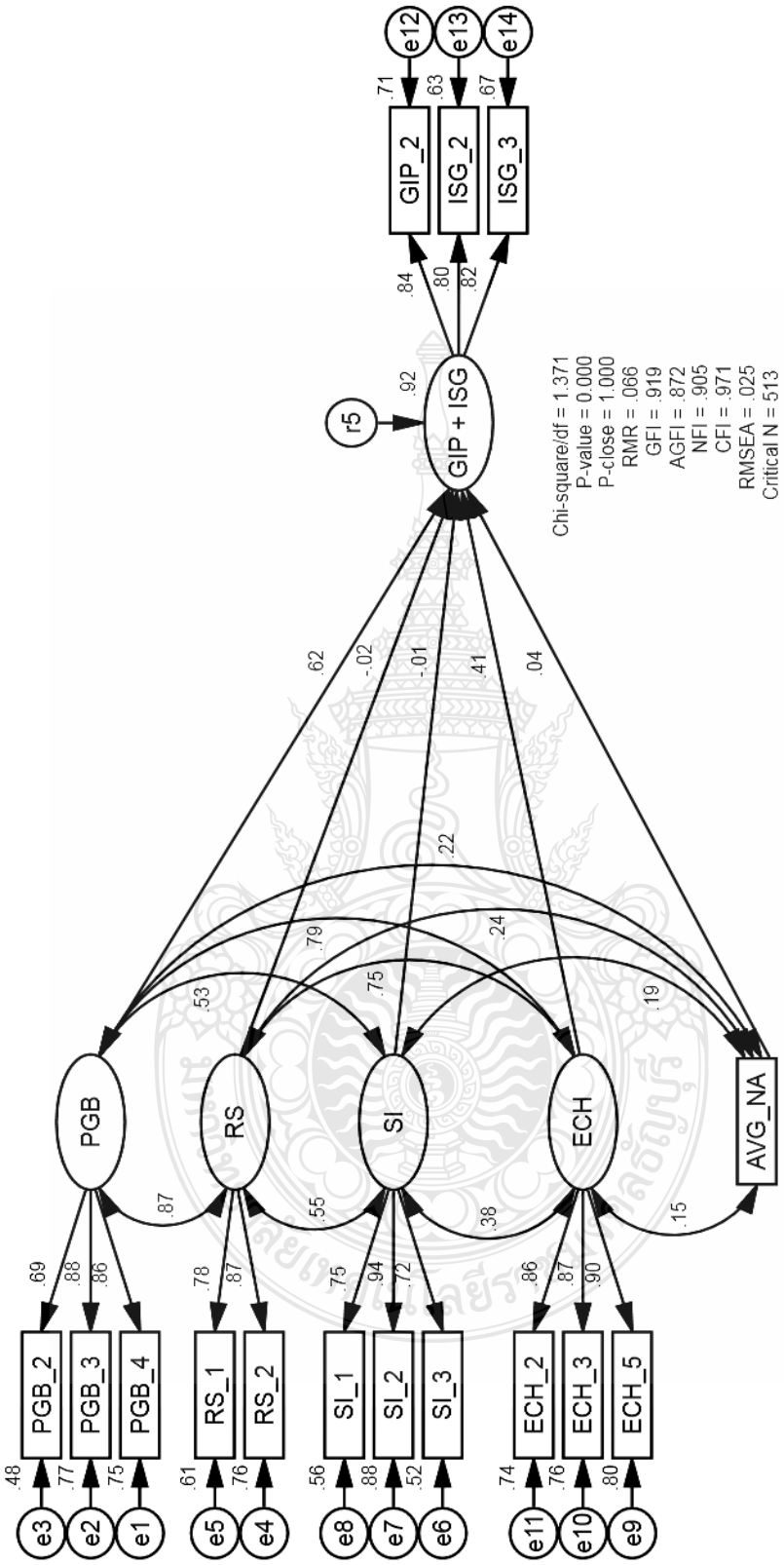


Figure 4.38 Standardized structural model (PGP = 3/5; Green workplace)

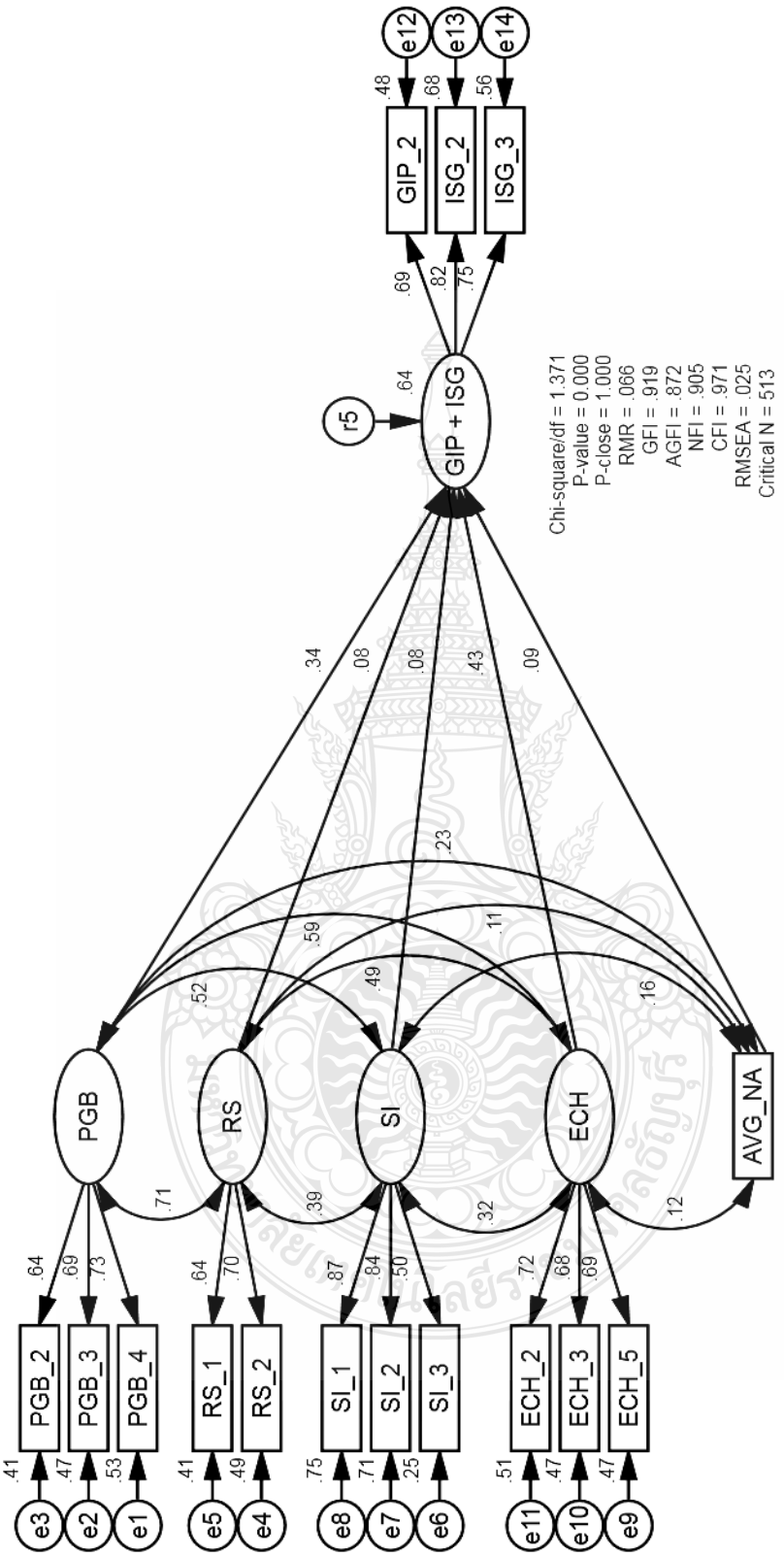


Figure 4.39 Standardized structural model (PGP = 4/5; Greener workplace)

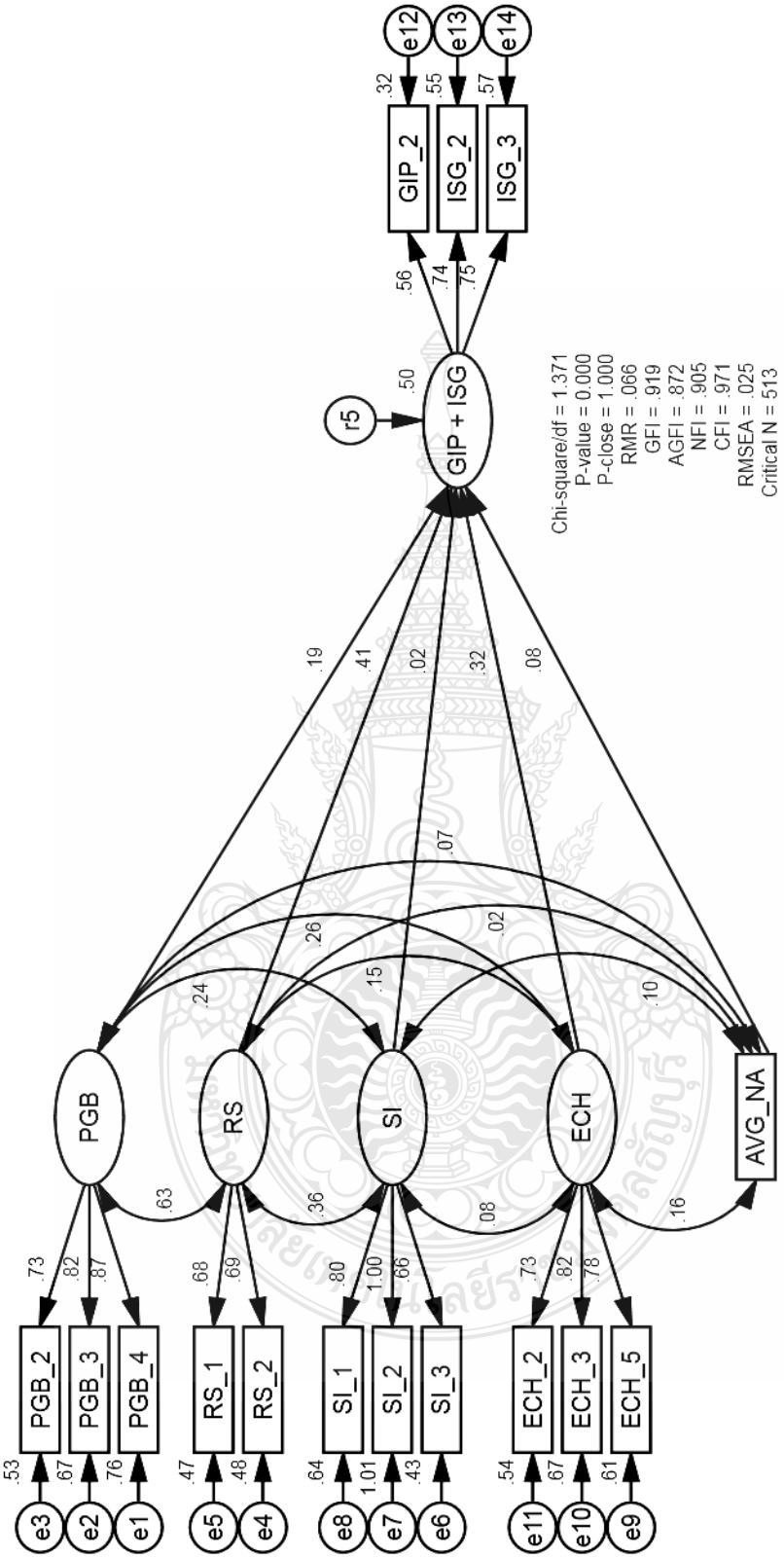


Figure 4.40 Standardized structural model (PGP = 5/5; Greenest workplace)

Earlier suggested in the literature review, respondents can be grouped by their workplace atmosphere in respect to eco-friendly policies. The previous four figures show multiple groups analysis in different level of PGP. Table 4.36 shows the comparison.

Table 4.36 Result of multiple group analysis (PGP comparison)

Group	Variable	Regression Weights				Standardized Regression Weight (β)	R^2
		Est.	S.E.	C.R.	p		
PGP = 2/5 Semi-green workplace	GIP + ISG ← PGB	.192	.663	.289	.772	.122	.92
	GIP + ISG ← RS	.813	.608	1.337	.181	.831	
	GIP + ISG ← SI	.001	.538	.001	.999	.000	
	GIP + ISG ← ECH	.048	.338	.142	.887	.044	
	GIP + ISG ← NA	-.004	.555	-.008	.994	-.002	
PGP = 3/5 Green workplace	GIP + ISG ← PGB	.962	.305	3.154	.002*	.617	.92
	GIP + ISG ← RS	-.026	.179	-.143	.887	-.025	
	GIP + ISG ← SI	-.006	.081	-.075	.940	-.005	
	GIP + ISG ← ECH	.489	.138	3.553	.000*	.413	
	GIP + ISG ← NA	.055	.082	.673	.501	.037	
PGP = 4/5 Greener workplace	GIP + ISG ← PGB	.332	.135	2.466	.014*	.335	.64
	GIP + ISG ← RS	.061	.091	.672	.502	.077	
	GIP + ISG ← SI	.047	.042	1.123	.262	.076	
	GIP + ISG ← ECH	.474	.100	4.729	.000*	.432	
	GIP + ISG ← NA	.068	.042	1.630	.103	.086	
PGP = 5/5 Greenest workplace	GIP + ISG ← PGB	.127	.086	1.474	.141	.188	.50
	GIP + ISG ← RS	.227	.089	2.544	.011*	.406	
	GIP + ISG ← SI	.007	.034	.197	.843	.016	
	GIP + ISG ← ECH	.300	.087	3.435	.000*	.324	
	GIP + ISG ← NA	.048	.043	1.103	.270	.081	

Acceptable significant level = < .05 (p = *), PGP = Perceived Green Org. Policy

Dissimilarity occurred in this study when using PGP as comparison criteria. As the lowest PGP score was 2/5, there will be only four groups available for the comparison.

People who are involved in a semi-green organizational environment (PGP = 2/5) showed no significance in all paths. With very high predictability (R^2 =.92) and no significant paths, this means that there is extremely low or no 'green heart' inside respondents in this group.

Green workplace group (PGP = 3/5) had two significant paths, which were PGB and ECH. People in this category showed that they are 'greenified'. They acknowledged the benefit of green IT product better than the other groups (PGB; β = .617, p = .002). Plus, they realized environmental issues (ECH; β = .413, p = .000). However, they had no willingness to pay an extra price for green IT (RS), no impact from a society for green persuasion (SI), and no effect from green label recognition (NA).

Greener workplace (PGP = 4/5) had the same two significant paths as the previous group. The only differences were the PGP path was lower (β = .335, p = .014) but ECH was higher (β = .432, p = .000) than the previous group. However, R^2 of this group was .64, which means that prediction power was only 64 percent.

The final group was the greenest one (PGP = 5/5). The ECH path still operated (β = .324, p = .000), but PGB path was turned insignificant. Instead of PGB, RS path became significant (β = .406, p = .011). Such statistical significance means people in this group are aware of the environmental problem and they will give every expandable resource to play their part. With R^2 at .50, the statistical significance can be corrected by 50 percent.

The overall comparison result between all models is available on table 4.37.

Table 4.37 Summary of all multiple group analysis

Model		Standardized regression weight of Path						
		PGB	**RS**	**SI**	**ECH**	**NA**	**PGP**	**R^2**
	Original	.316*	.155*	.056	.435*	.066*	.088*	.78
	Expanded PGP	.311*	.158*	.056	.432*	.067*	.078*	.78
Gender	Male	.290*	.254*	-.002	.384*	.041	.114*	.81
	Female	.368*	.025	.130*	.478*	.090*	.073	.73
Age	< 20	.438*	-.012	-.009	.625*	.031	-.030	.98
	20 - 30	.531*	.073	.030	.303*	.040	.109*	.73
	31 - 40	-.130	.632	.126	.390*	.123	.099	.89
	> 40	-.101	.306*	-.104	.775*	.000	.206*	.87
Education	< Bach.'s	.403*	.057	.023	.485*	.050	.045	.91
	= Bach.'s	.386*	.117	.125*	.341*	.064	.060	.75
	≥ Master's	-.262	.608	-.045	.489*	.130	.251*	.56
Perceived Green Policy	PGP = 2/5	.122	.831	.000	.044	-.002	n/a	.92
	PGP = 3/5	.617*	-.025	-.005	.413*	.037	n/a	.92
	PGP = 4/5	.335*	.077	.076	.432*	.086	n/a	.64
	PGP = 5/5	.188	.406*	.016	.324*	.081	n/a	.50

Acceptable significant level = < .05 (p = *), n/a = Not available,

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,

ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product,

ISG = Intention to Support Green business

4.4.6 Extended PGP model

This section details each green organizational policy and ranks them. If key people of businesses know what green policy can help the environmental, they might know priority such policies. Figure 4.41 is the expanded PGP standardized structural model, and its result is shown in table 4.39 and 4.40.

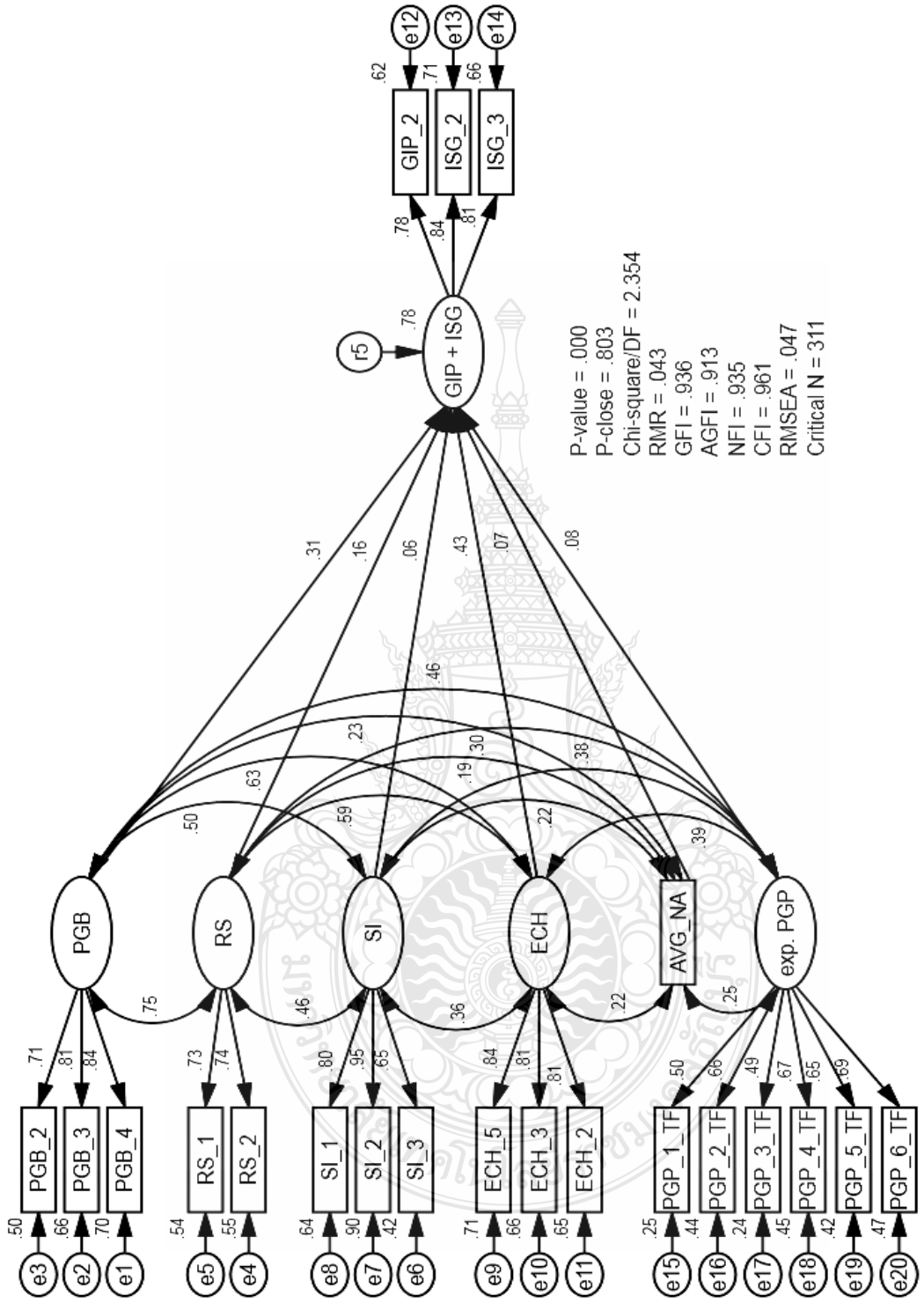


Figure 4.41 Standardized structural model (expanded PGP)

Table 4.38 Chi-square different test between single-indicated and expanded PGP

Model	Chi-square	df	P-value	Invariant?
Single-indicated PGP	171.849	85	.000	
Expanded PGP	397.814	169	.000	
Number of groups		2		
Groups are different at the model level.			**0.000**	**NO**

PGP = Perceived Green organizational Policy

Table 4.39 Comparison between single-indicated PGP and expanded PGP

Model	Variable	Regression Weights				Standardized Regression Weight (β)	R^2
		Estimate	S.E.	C.R.	p		
Single-indicator	GIP + ISG ← PGB	.365	.076	4.819	.000*	.316	.78
	GIP + ISG ← RS	.139	.058	2.383	.017*	.155	
	GIP + ISG ← SI	.045	.028	1.603	.109	.056	
	GIP + ISG ← ECH	.507	.054	9.396	.000*	.435	
	GIP + ISG ← NA	.070	.030	2.325	.020*	.066	
	GIP + ISG ← PGP	.079	.027	2.878	.004*	.088	
Expansion	GIP + ISG ← PGB	.358	.078	4.593	.000*	.311	.78
	GIP + ISG ← RS	.142	.059	2.389	.017*	.158	
	GIP + ISG ← SI	.045	.028	1.575	.115	.056	
	GIP + ISG ← ECH	.504	.054	9.258	.000*	.432	
	GIP + ISG ← NA	.071	.030	2.346	.019*	.067	
	GIP + ISG ← PGP	.094	.047	2.006	.045*	.078	

Acceptable significant level = < .05 (p = *)

While a variant was found in the chi-square different test, the regression weights between the two models were almost the same, except for PGP itself. Table 4.40 displays a comparison of green organizational policies. This study uses factor loading as a criteria.

Table 4.40 Estimation of inner correlations of expanded PGP

Observed variable	Regression Weights				Std. Regression Weight (β)	Rank
	Est.	S.E.	C.R.	p		
PGP_1 ← PGP (Air quality management)	1 (fixed)	-	-	-	.503	5th
PGP_2 ← PGP (Water efficiency)	1.098	.104	10.574	.000*	.663	3th
PGP_3 ← PGP (Reforestation/Wildlife restoration)	.985	.111	8.897	.000*	.491	6th
PGP_4 ← PGP (Waste management)	1.326	.125	10.651	.000*	.673	2nd
PGP_5 ← PGP (Recycling/Reuse)	1.159	.111	10.464	.000*	.649	4th
PGP_6 ← PGP (Energy efficiency)	1.082	.101	10.762	.000*	.688	1st

PGP = Perceived Green organizational Policy

The expanded model suggests that energy saving policy has the highest importance level (PGP_6, β = .688, p = .000), followed by waste management (PGP_4, β = .673, p = .000), water saving (PGP_2, β = .663, p = .000), recycling and reuse (PGP_5, β = .649, p = .000), air pollution reduction (PGP_1 = .503, p = .000), reforestation and wildlife restoration (PGP_3, β = .491, p = .000). This result reveals that many Thai organizations have a low level of reforestation and wildlife restoration. For air quality management policy, it is quite difficult to ascertain because indoor employees might know nothing about such policy compared to outdoor staff. However, it is significant to maintain low air pollution to be safer from external auditors.

The next section is a qualitative approach. All writings from the optional section in the questionnaire are seriously examined.

4.5 Qualitative analysis

The questionnaire carries four sections. The last section is an open-end question for free discussion about environmental issues. There were 70 respondents who voluntarily commented in the last section. Approximately, it is ten percent of all sample size. These answers can be used for additional explanation of relationships and suggestion in conclusion. Raw data in Thai is available on page 302 in the appendix section (Table A.4).

Regarding to Creswell (2015), the mixed method in this study is an 'explanatory sequential design', which both qualitative and quantitative are used to support (and/or confirm) each other (pp. 37-41). This study followed Creswell's (2016) instructions to comprehend the comments. Creswell (2016) taught a quick five-step of raw data analysis, as follows: (1) Initially read through all the data; (2) Then, divide text into segments of information; (3) Next, label segments of information with codes; (4) And, reduce the overlap and redundancy of codes; (5) Finally, collapse codes in themes (p. 155).

Regarding the 70 respondents, those ideas can be grouped by match their gist to study constructs. Codes that match to study constructs are showing in table 4.41.

Table 4.41 Matching codes and study constructs

Construct /Theme	**Code**	**Mentioned respondent**
ECH	An increase of foam packages and plastic bags	4
	Rapid e-waste generation	4
SI	Household Green instilling	13
	Household waste sorting	9
	Household energy saving	2
	Green promotion	6
PGB	Rushed manufacturing	5
	Green deception	4
RS	Green additional product cost	1
NA	Cooperation for knowledge distribution	18

Table 4.41 Matching codes and study constructs (Cont.)

Construct /Theme	Code	Mentioned respondent
	Environmental protection regulation	5
Government	Alternative resource	3
Participation	Patriotism	1
	Environmental treatment	1

PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,
ECH = Environmental Concern & Habit, NA = Noticeability

The next is summarization of respondents' messages, which are categorized by related study constructs.

Environmental Concern & Habit

For the most part, Thai people are already aware of environmental problems, which humanity has faced for a very long time. One-time-use plastic bags and Styrofoam packages are not good and for people it is common sense. Not only the negative impact on the eco-system, but also human health. Yet people have no idea for the alternatives, they continue use plastics and foams in daily life. Safer packaging, such as natural fiber package, is denied by food vendors and some businesses due to additional cost.

Waste from daily life is one thing and electronic waste is another. One respondent wrote about a power bank as e-waste that been tossed into landfills. E-waste created from non-green shopping criteria as well. Customers enjoy choosing richness in performance rather than eco-friendliness, wrote two commenters.

Social Influence

There were only two respondents mentioning energy saving. Thai public and private sectors have done a good job so far in encouraging people to be aware of household electricity usage. Energy and water saving are too common to be discussed as everybody already knows. However, 'knowing' and 'doing' are not in the same vein, said respondents.

Respondents criticized the household waste sorting procedure in Thailand. Participants stressed that one drawback in public waste management is poor waste sorting as government garbage collectors mix everything in the same bin truck. Therefore, people have no way to separate their household waste. However, many respondents believed that parents or older relatives must instill environmental concern to their children. Simply separate their household waste; garbage, recyclable, hazardous, etc. In conclusion, the environmental concern should be a rule-of-thumb in Thai society without delay.

Six participants stated that the current level of green knowledge and awareness in Thai society are too low. There is no point to advertise green IT products when 'Green' is an abstract concept for 'Thailanders'. Respondents intimated that businesses should make more effort to educate Thai people. For example, green promotion via broadcast, internet, printed media and so on. Summarily, green instilling of a society may not be accomplished if households and the private sector are not working together.

Perceived Green Benefit

Participants pointed out overcritical manufacturing. Global technology market is on fast-track nowadays. This forces businesses to hurry up against their commercial rivals. Due to this, new technological products are hurriedly released, annually. This policy causes frequent purchase. As a result oceans and landfills full of e-waste. Although they are environmental friendly, pile of e-waste still need many years to be degraded.

The last sentence in the previous paragraph automatically corresponds to industry waste management. As two respondents suggested, manufacturers keep their hurried fabrication which results in pollution emission. Thai people conceptualized that big businesses errant pollution rather than playing a good citizenship role. This indirectly indicates that 'green' from commercial mouths are deception in some people's point of view. With this in mind, credibility of green IT benefit is minified.

Resource Sacrifice

The other idea in people mind is technology companies are able to improve functionality and greenness in their new products, without additional cost. If additional

cost exists, a respondent believe that it might be for profit rather than intention to protect the environment.

Noticeability

There were eighteen participants that mentioned cooperation for the greater good. On one hand, people simply know that the government has many eco-friendly campaigns to motivate people to go green, Label No.5 of energy saving, for example. On the other hand, some environmental campaigns hold no meaning for people, such as Thai green label, water footprint, and carbon footprint.

The other thing that respondents want to see is green instilling as a national agenda. The two sectors, which are public and private, need to participate equally. It is common to previous themes as people need the both sectors to try harder and harder for the 'greenification' of Thai society.

Government Participation

This theme is out of this study focus. Some participants put some weight on public sector's actions as unforgettable factor. Respondents pointed out that deforestation was a parasite to the eco-system and can be remedied by a law. People believe that the law is a powerful tool of a society. Respondents also implied that using laws to protect the environment and wildlife is not effective enough. Accordingly, deforestation still occurs rampantly.

One respondent briefly commented that the Thai government should learn from the Japanese government. Due to reasonable patriotism, Japan is one of eco-friendliest nations. Willingness to use eco-cars and success green instilling are good examples to be defined. Using alternative resources is one of many ways to preserve the earth condition. A respondent wrote that the Thai government should put more effort in supporting alternative resource usage. Although the Thai government already has water treatment systems, one of respondents criticized that it needs to be improved.

Respondents want to see governmental support of businesses in green products and services, and rewarding consumer green purchasing. For example, tax reduction for the green participation of both buyers and vendors.

4.5.1 Qualitative conclusion

Perceived Green Benefit

Critical sentences, such as “green is a lie”, “all about commercial rather than corporate environmental responsibility”, and the likes, show that the influence of *Perceived Green Benefit* (PGB) is weak. From the mixed result, people are not likely to ignore green IT products under two circumstances: if green benefit is clearly observable; and if such products are available on the market.

Resource Sacrifice

Some critical comments, for example, “there is no need to pay a premium price for greener quality”, and “no need to drop product performance to go green” show that *Resource Sacrifice* (RS) impact is quite low as well as in the quantitative result. Financial resource and product functionality are high priority criteria, not eco-friendliness. This presents a positive influence from RS to PGB. If a premium price is prohibitive, customers would let the green IT product go.

Noticeability

Many respondents suggested that green instilling by public and private sectors in people is urgently required. This implies that green knowledge, such as green label recognition (*Noticeability*; NA), is socially significant.

Social Influence

Although *Social Influence* (SI) was not significant in the original model analysis, it has some merit in the female group and bachelor’s degree group models. In the qualitative approach, the highest priority dimension of social influence is family as mentioned by respondents, which coheres to descriptive statistic of SI.

Environmental Concern & Habit

The strongest effect, *Environmental Concern & Habit* (ECH) shone in all group models. So many participants mentioned environmental concern and that urban life-style is slowly demolishing the eco-system. Reckless use of plastic bags and foam packages were good examples. ECH turned out to be a very significant factor in many remarks. In addition, many respondents proposed that people need to know more about green IT products, together with environmental awareness, and then they will have a reason to seek green IT products. This hints a new connection from PGB to ECH: If

people know how important green IT is, they likely to have plenty of environmental knowledge.

From all respondent's comments, there are suggested factors to be discovered, as follow: Green level of household and Perception of green public campaigns.

Regarding the *Resource Sacrifice, Perceived Green Benefit,* and *Environmental Concern & Habit*, a significance emergence of regression paths of PGB ← RS, and ECH ← PGB are expected. Figure 4.42 and table 4.42 show quantitative results of the surmises.

Table 4.42 Alternative model path analysis result

Model	Variable	Regression Weights				Std. Regression Weight (β)	R^2
		Est.	S.E.	C.R.	p		
Alternative	GIP + ISG ← PGB	.226	.092	2.445	.014*	.253	.78
	GIP + ISG ← RS	.216	.107	2.027	.043*	.225	
	GIP + ISG ← SI	.037	.030	1.221	.222	.046	
	GIP + ISG ← ECH	.505	.054	9.343	.000*	.437	
	GIP + ISG ← NA	.070	.030	2.324	.020*	.067	
	GIP + ISG ← PGP	.080	.027	2.947	.003*	.090	
	PGB ← RS	.919	.068	13.486	.000*	.854	.73
	ECH ← PGB	.506	.036	13.938	.000*	.656	.43

Acceptable significant level = < .05 (p = *),
PGB = Perceived Green Benefit, RS = Resource Sacrifice, SI = Social Influence,
ECH = Environmental Concern & Habit, NA = Noticeability, PGP = Perceived Green organizational Policy, GIP = Green Intention to Purchase/use IT product,
ISG = Intention to Support Green Business

The path analysis is established that the surmises are true. PGB ← RS and ECH ← PGB have shown mighty significant levels and regression weights. Thus, this study concludes the extra relationships, as follow:

1. Willingness to sacrifice money and product functionality for green IT product positively impact on green IT benefit perception (PGB ← RS; β = .854, p = .000).
2. The higher the individual green IT benefit perception, the more environmental knowledge an individual has perception (ECH ← PGB; β = .656, p = .000).

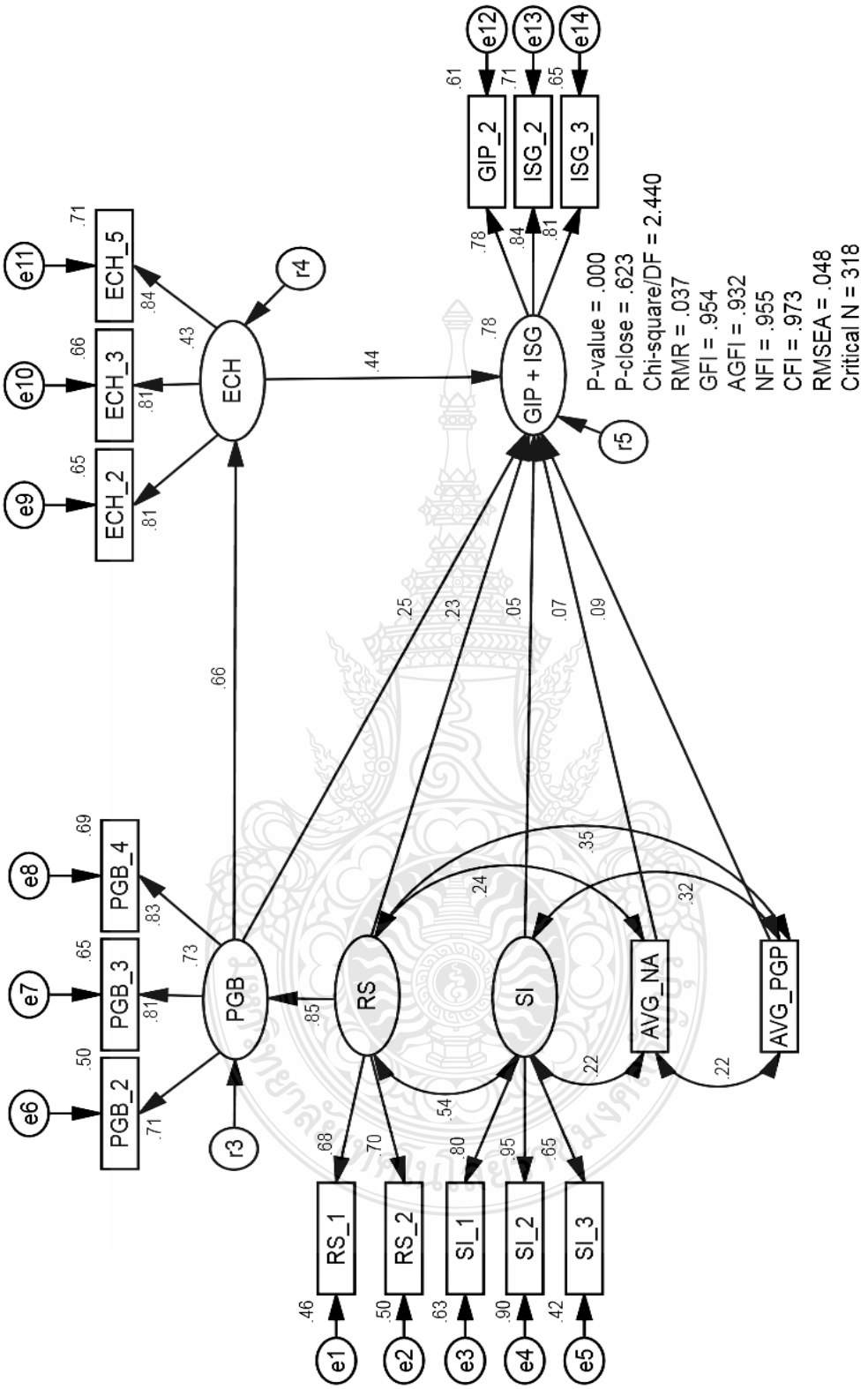


Figure 4.42 Standardized structural model (alternative)

4.6 Redefining the integrated construct

The juncture of discriminant validity issue forced *Green Intention in Purchasing or Using IT Product* (GIP) and *Intention to Supporting Green Imaged Business* (ISG) to be mixed. It is probably because the two factors originated from the same starting materials, the intention to use in acceptance theories, such as UTAUT and IS Success.

Table 4.43 shows the previous definitions of the two factors plus redefining of the united one. The unified factor is named 'Green IT and Businesses support', which is defined to be a single measurement tool to investigate an acceptance of green IT products/services and green-imaged businesses by an individual.

Table 4.43 Redefining of GIP + ISG

Construct	Abbreviation	Definition
Green Intention in Purchasing or Using IT Product	GIP	The degree to which an individual plans to look for environmental friendliness of an IT product before purchase and use in the future.
Intention to Supporting Green Imaged Business	ISG	The degree to which an individual intends to purchase a product from businesses that have green images/reputation in the future.
Green IT and Businesses Support	GIBS (GIP + ISG)	The extent to which an individual plans to support (purchase, use, hire, etc.) a green IT product/service and green imaged business in the future.

4.7 Finding conclusion

This section simplifies all results into a verbal language. Each observed variable has its own focus, which can interpret people beliefs in respect with environmental friendliness. All construct conclusions will summarize quantitative result and qualitative result, respectively. There are six constructs to be concluded, which are *Perceived Green Benefit, Resource Sacrifice, Noticeability, Social Influence,*

Environmental Concern & Habit, Perceived Green Policy and *Green IT and Business Support.*

4.7.1 Perceived Green Benefit

Regardless of e-waste reduction, perception of green IT benefits convinces an individual to 'greenify' his/her IT consumption. This phenomenon will greatly significant for women, young adults (20-30), bachelor's degree graduates. The same phenomenon is weak for men, teenagers (younger than 20), under bachelor's degree graduates, personnel in green (but not greenest) organizations. Oddly, this effect becomes softer when a consumer gets older (especially women) and graduates higher. The oddly phenomenon is explained in section 4.6.3, 'Assumption of the negative moderating effects of PGB' (in the page 149). In addition, green IT benefits are not well perceived until product price and performance are met.

Term 'Green', 'environmentally friendly', 'eco-friendly' and the likes are easily understood by Thai people. When customers look at these terms, they sense energy efficiency at the first place, but unsure about reduction of negative impact and e-waste. People realizes that it possibly impossible to reduce e-waste and negative impact if businesses are rushing their rivals with rapidly product release. According to a good citizenship duty, consumers say that they have to choose a green IT product even though they do not know which one is it, and still unsure about green benefits. It probably is personal image protection rather than pure green heart.

4.7.2 Resource Sacrifice

Without a consideration of temporal resource, men, especially older than 40 and relate to very green organizations, will spend financial resource and accept reduced product functionality to go green. Such generosity can also influence perception of green IT benefit (previously suggested) and pass the effect to green IT and businesses support. In addition, this effect becomes stronger when educational background of a consumer is higher.

On the one hand, spending extra price and reducing product capability for green reason is acceptable for Thai consumers. Descriptive statistic resulted that answers were somewhere between neutral and strongly agree. On the other hand, the qualitative result found that "there is no reason to raise a price and to cut product

capability for eco-friendliness except commercial", said a few respondents. A balance between what customers pay and what they get is always a major criterion of shopping. However, temporal resource (time) is expendable for green consumption.

4.7.3 Noticeability

This label noticeability was significant to green IT and businesses support. The impact was low, and it is show importance to women rather than men, though.

Partial observation of environmental knowledge was done with recognition of green labels test. These are broken down descriptive statistic results of recognition of green labels: Thai Label No.5 was recognized by 99.7 percent of respondents; Thai Green Label was recognized by 79.6 percent of respondents; Recycle symbol was recognized by 53.9 percent of respondents; Energy Star logo was recognized by 52.4 percent of respondents; CE mark was recognized by 40.5 percent of respondents; and TCO logo was recognized by 12.8 percent of respondents.

Unsurprisingly Thai consumers are well familiar with Thai Label No.5. This public champing was much accomplished than people give it credit for. It was a good quality fruit of well-planned propaganda, which never be forgotten. This evidences that governmental environmental policy influences an individual environmental concern. Only .3 percent (two respondents) did not recognize this label, which leave no idea to explain why.

Thai Green Label is not as famous as the Label No.5 according to lack of advertising and specific purpose of using. However, Thai consumers still can guess due to a word 'Green'. Recycle symbol has so many figures to be doubted, but the gist is still visible. Energy Star is only for electronic product, thus non-tech geeks might hardly seen the meaning. CE mark and TCO logo are rarely seen by ordinary consumers. With no advertising and less study in Thai education, CE and TCO are enigmatic.

4.7.4 Social Influence

Social impact has positive impact on an innovation adoption in many theories, but a contrast result was appeared in a green IT context. Many 'Thailanders' comprehended green IT products as abstractions. As a result, there shown no social impact on green IT and businesses support, except for women and bachelor's degree graduates.

After separated the descriptive statistic result of *Social Influence*, workplace influence is the most undeniable, followed by close relations, such as family and friends. For media, it is on a neutral feeling rather than agree. This means media might not be the best source to 'greenetize' people. This suggests that an opinion leader, such as a celebrity, is not enough for a green IT product diffusion.

From the qualitative section, a family is suggested to be the first place to instill environmental friendliness. Younger relatives will absorb green spirit from admirable elders. This is the first step to polish Thai society.

4.7.5 Environmental Concern and Habit

This construct is composed of five aspects: negative impact of plastic and foam package usage, negative impact of littering, the environmental balance, natural resource insufficiency, and existence of global warming. All aspects were believed as crucial topics. This describes people acknowledgement in Thai society.

Although questions about plastic/foam use and natural resource (ECH_1 and ECH_4) are dropped, it is the most influence and significant to green IT and business support. Women (who are older than 40 or younger than 20) have the strongest influence in this positive relationship. There was just one diagram (semi-green workplace) that this construct lacked of significance. The relationship becomes stronger when a consumer gets older. Environmental concern was a mediator between perception of green benefits and, green IT and business support. People who are well perceived green benefits of product will carry environmental concern at the similar extent.

Thai society is full supplied with environmental awareness but not the actions to some extent. From the qualitative result, people want public sector, private sector, and other people to be greener. In this setting of the environmental responsibility, nobody blame himself/herself about every day habit. This hints that environmental concern and good habit can rarely be shared from a person to a person.

4.7.6 Perceived Green Policy

The current level of environmental friendliness of Thai organizations looks green. This is broke down descriptive statistic outcome of perception of green policies: 77.7 percent of respondents said energy saving policy exists in their organizations; 73.6 percent said water saving policy exists in their organizations; 66.3 percent said

recycling and reuse policy occurs in their organizations; 56.1 percent said waste management (regardless of recycling/reuse) appears in their organizations; 40.3 percent found reforestation or wildlife restoration exists in their organizations; and 38.3 percent believed air pollution reduction exists in their organizations.

Perception of green policies was emitted low regression power from itself to green IT and business support. However, it was significant. Statistical outcomes suggested that the effect will be stronger for men, who are between 20-30 or over 40, and have master's degree or higher.

None of respondents mention about policy or policing in their organizations. In addition, people who are in the same organization have different answer about perceived green policy. It primarily depends on an individual. Thus, although eco-friendly policies are perfect, they do not means that employees do concern.

4.7.7 Green IT and businesses support

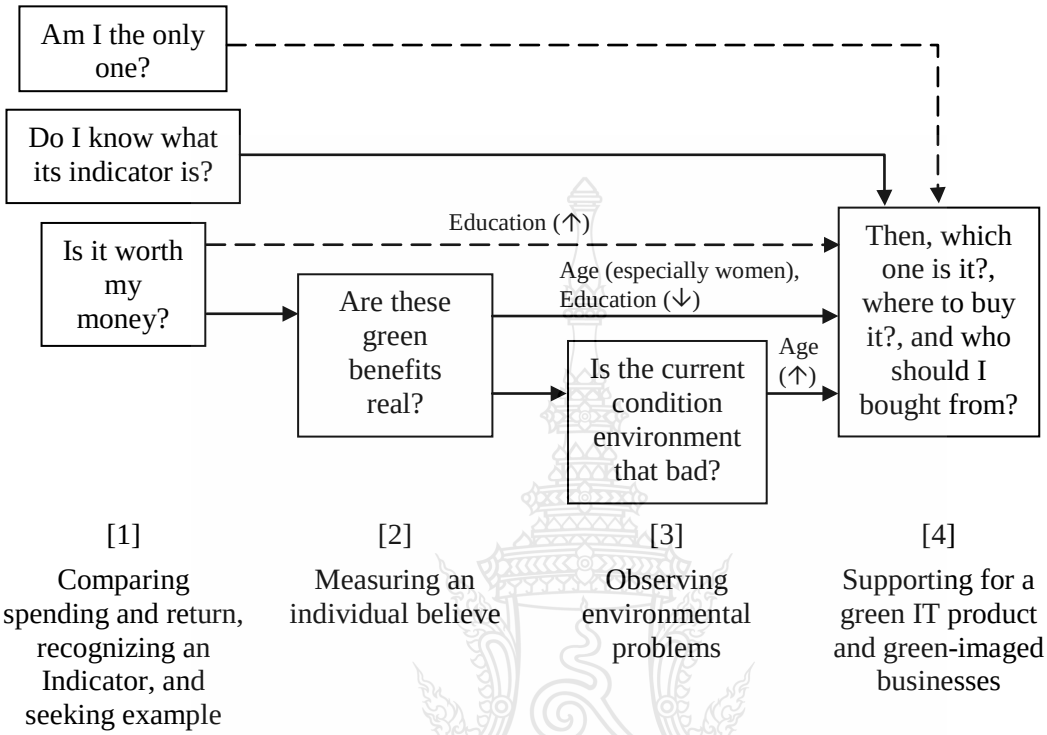
This compound construct carries investigations green intention to buy/use IT product, and intention to support green-imaged business.

In the descriptive statistic of intention to support green IT product, only 4.7 percent of respondents disagreed to spend time for comparison of energy efficiency and possibly negative impact on the eco-system before purchase an IT product; 8.9 percent said no to seek for eco-friendly knowledge before shopping; and 7.4 percent do not like to aware of eco-label when buying product.

In the descriptive statistic of intention to support green-imaged business, only 8.7 percent of respondents disagree to be on the mind of green image of a firm; 6.5 percent will not support green-imaged business even though such image is visible; and 4.8 percent do not care if such image is auditability or not.

There are less than ten percent of Thais who answer 'no' when asked about green IT product acceptance. The doorstep to the acceptance is worthiness. A consumer scales financial loss and retrieved benefit. After entered the door, a consumer will not hesitate if the green benefits are trustworthy. The next step is concern about the current severeness of the environment. Then he/she see an inevitably reason to pay for green items. This paragraph is based on mixed method approaches plus the extra two hypotheses.

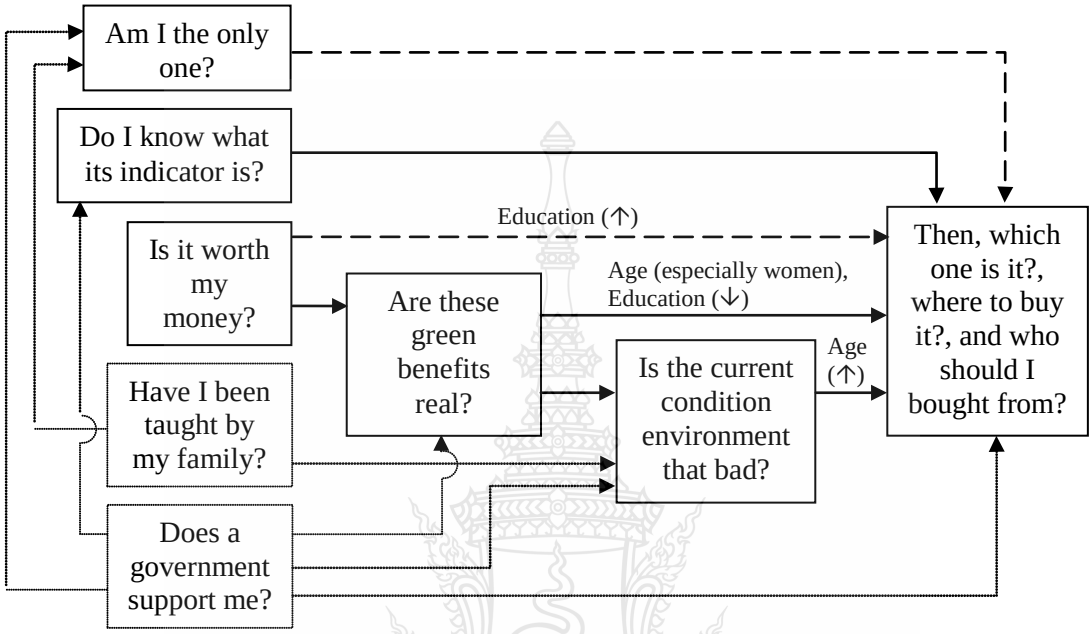
Regarding to all finding conclusions, all potential impacts are depicted in figure 4.43.



Lines/hairs (____) are discovered impacts, dashed lines (_ _ _ _) mean possible impact, above the lines are moderating effect, the upwards arrows (↑) indicates fortified effects and the downward arrow (↓) means a weaken effect.

Figure 4.43 Process of consumer thinking of green IT product

The two revealed factors, which are condensed in the qualitative approach, should not be forgotten. The factors (*Green level of household* and *Perception of green public campaigns*) are illustrated on figure 4.44.



Lines/hairs (——) are discovered impacts, dashed lines (- - - -) mean possible impact, dotted lines (……) are required further research, above the lines are moderating effect, the upwards arrows (↑) indicates fortified effects and the downward arrow (↓) means a weaken effect.

Figure 4.44 Extended process of consumer thinking of green IT product

4.7.8 Chapter conclusion

This chapter is finally closed. The scrutinization of the quantitative and qualitative approaches is fulfilled. In this chapter, demographical data and descriptive statistic are explicated. Without 30 answers in the pilot-test, there are overall 618 respondents from both online and printed surveys. All harvested data did not require

normalization because they were ranked scales. The Multicollinearity test was flawlessly passed.

In the convergent validity audit, with confirmatory factor analysis (CFA), all loading factor weights were acceptable and most model fit indices were numerically satisfied. In the discriminant validity inspection, testing with a common latent factor (CLF) and different chi-square test showed no disparity. Unfortunately, the AVE examination pointed out indiscriminateness. PGB, RS, and ECH some variables were dropped for survival sake. GIP and ISG were blended to maintain the study objective.

The path analysis, the multiple group analysis, and the interaction effect analysis provided acceptance of all the hypotheses, except the fourth one. The qualitative approach rendered the acceptance of the first three hypotheses, but not the last two. The literal screening in all comments revealed the extra paths (RS → PGB → ECH → GIP + ISG), and their effect were significant.

The next chapter is the main conclusion. Answering all research questions, recommendation, study limitation, suggestion for future exploration, and the likes will be provided.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

Structure of this chapter

This last chapter presents discussion and recommendation of the whole research. It is composed of four topics, as follows:

5.1 Conclusions

5.2 Discussion of the research finding

5.3 Research limitation

5.4 Implication and future research and stakeholders

5.1 Conclusion

This research investigates the connection between the individual perceptions of green IT benefits, individual resource sacrifice, environmental knowledge, environmental concern, social influence and green consumption behaviors. There are three foci of this research that are written in the first chapter, which are

(1) investigating perspectives and environmental awareness of consumers regarding their IT product purchasing behavior, knowledge of green IT products adoption/consumption, and environmental awareness within the social sphere,

(2) identifying the factors that act as catalysts in the increased awareness of green purchase and use of IT products and intention to support businesses that have green image resulting from consumer sentiment, and

(3) the final result of this research is the study model, which has the ability to predict the promulgation of sustainable development via relationship between environmental awareness of individuals in IT-involved behaviors and willingness to support businesses that have a green image.

As discussed above, there are three foci of this study. All three study purposes are finally fulfilled.

There are five study questions to be answered, as follows:

1. What are the factors that increase environmental awareness in IT consumption?

2. Does environmental social awareness impact IT consumption? And how great is environmental awareness in the Thai social sphere?
3. Does environmental concern and knowledge of individuals increase environmental awareness in IT consumption?
4. Does individual intention to use/purchase green IT product drive individual support for businesses that are environmentally friendly?
5. How strong is the influence of environmental policies of Thai organizations on employee attitudes?

This research employs quantitative and qualitative methodologies. For quantitative methodology, the online and printed questionnaires were distributed for data gathering. The questions were asked in regard to perception of green IT benefits, cognitive trade-off between green IT products and the price and capability, green label noticeability, influence of casual and formal relationships, environmental awareness, intentions to support green IT products, businesses and an influence from workplace (or other system, such as family) policy. For qualitative approach, there is an open-end question in the questionnaire, which allowed participants to provide free discussion about the environmental situation. Open-end answers are used to enlarge detail of quantitative results. Moreover, they are used to explain the rejection of hypothesis and evidenced possibility of relationships between *Perceived Green Benefit, Resource Sacrifice* and *Environmental Concern & Habit*.

Originally, there were two independent variables, which were *Green Intention to Purchase/Use IT Product* and *Intention to Support Green Business*. Due to the lack of discrimination, the two independent variables had to be unified.

5.2 Discussion of the Research Findings

The five research questions are answered and discussed in this section. Table 5.1 shows details of research questions and answers.

Table 5.1 Details of research questions and answers

#	Research Question	Element of Answer
1	What are the factors that increase environmental awareness in IT consumption?	1. Literature review 2. Quantitative result 3. Qualitative result
2	Does environmental social awareness impact IT consumption? And how great is environmental awareness in the Thai social sphere?	1. Insignificance of *Social Influence* (H2) 2. Multiple group analysis 3. Descriptive statistic 4. Qualitative result
3	Does environmental concern and knowledge of individuals increase environmental awareness in IT consumption?	1. Influence of *Environmental Concern & Habit* (H3) 2. Influence of *Noticeability* (H1) 3. Multiple group analysis 4. Qualitative result
4	Does individual intention to use/purchase green IT product drive individual support for businesses that are environmentally friendly?	1. Discriminant validity issue between *Green Intention in Purchasing or Using IT Product* and *Intention to Support Green Imaged Business* (H4)
5	How strong is the influence of environmental policies of Thai organizations on employee attitudes?	1. Influence of *Perceived Green Organizational Policy* (H5) 2. Multiple group analysis 3. Expanded PGP model's result

5.2.1 Discussion of the First Research Question

What are the factors that increase environmental awareness in IT consumption? This question can be simply answered by review of literature, the qualitative and quantitative results. Selected literature presents, as follows:

(1) Individual perception of green IT product benefits

(2) Individual willingness to sacrifice

(3) Individual green label noticeability

(4) Social awareness (only females and bachelor's degree graduates)

(5) Individual environmental concern and habit

(6) Greenness of workplace influence

(7) Green level of household (from qualitative approach)

(8) Perception of green public campaigns (from qualitative approach)

5.2.2 Discussion of the Second Research Question

Does environmental social awareness impact IT consumption? And how great is environmental awareness in the Thai social sphere? The answer is yes, it does, but the impact was very small.

Previously, social factor was shown to have no effect on intention to support green IT product and green business. None of moderating effect was found. Thus, the second hypothesis, which is "Social Awareness (*Social Influence*) has an influence on *Green Intention in Purchasing or Using IT Product* with gender, age and educational experience as moderating factors," is rejected. Since this result is completely different to many technological acceptance theories/studies, further proving might diminish the ambiguity.

From multiple group analysis, regression results rendered that only female consumers and bachelor's degree graduates are capable of feeling the social impact regarding environmental friendliness. Vandervoort's (2000) finding was "men were more isolated than women although there were no gender differences in perceived adequacy ... or network size." For education level, many bachelor's degree graduates simply understood how technology affects the eco-system. The lower levels of education might have no idea of the negative impact, and the higher ones will have higher skepticism as in Hill's (2011) explanation. Although an individual environmental

awareness has great influence, it not likely to be shared with the other people. Thus, these assumptions could be keys of this social puzzle.

Additional qualitative approach provides more information on social factors. Household culture is a beginning of green behavior. Family members and close friends are good sources of persuasion for green life-style.

5.2.3 Discussion of the Third Research Question

Does environmental concern and knowledge of individuals increase environmental awareness in IT consumption? The answer is "Yes, it partially does" according to the first and the third hypothesis.

The third hypothesis is "Environmental Concern and Habit has an influence on Green Intention in Purchasing or Using IT Product with Gender and Age as moderating factors." It is partially accepted, because age (moderating factor) was the only one that had an effect on environmental concern. This implies that Thai people are concerned about the negative impact on the environment no matter what gender and educational level. However, increase of age can boost environmental concern. It seems that older people have more worry than younger people.

From significance of *Noticeability*, green label noticeability positively related to an acceptance of green IT products and a supporting of green businesses. However, individual green label noticeability has very low influence. This phenomenon is also happened is various studies (e.g., Truffer et al., 2001; Banerjee and Solomon, 2003; Kaenzig et al., 2013; Herbes and Ramme, 2014). The meaning is that although consumers very well recognize green indications, it refers nothing if other factors (price, function, appearance, etc.) are inappropriate. Consumers will concern product price and capability, then benefits of green IT product that match their environmental concern.

5.2.4 Discussion of the Fourth Research Question

Does individual intention to use/purchase green IT product drive individual support for businesses that are environmentally friendly? The answer is no, it does not. Due to the discriminant validity issue, the intentions to support green businesses (ISG) and to buy green IT products (GIP) are on the same topic, thereby rejection of the fourth hypothesis. This says that one answer can answer the two questions in roll. The gist is consumers perceive a buying from company A and supporting company A are the same.

From acceptance models, a behavior intention (construct) is one object, which one does not simply benefit when break it down. Only suggested resolution is combination of the two intentions. Accordingly, new name of the combined intention should be “green IT and business support.”

5.2.5 Discussion of the Fifth Research Question

How strong is the influence of environmental policies of Thai organizations on employee attitudes? It is undoubtedly weak due to following reasons: First, the regression weight from a workplace atmosphere to the both intentions was weak but significant. Second, none of respondents mention about workplace policy. Finally, policy perception is unlike although respondents are working in the same organization. Perhaps an origin of the quirkiness is horribly low job and life satisfaction.

Although workplace policies weakly influence intention to support green IT and green business, this study discovered that energy saving is a top priority of a firm, follows by waste management (reduction and clean disposal), water efficiency, recycle/reuse, air quality management (reduce air pollution) and reforestation.

5.3 Research Limitation

This research encountered two major limitations, which are sample size and discriminant validity issue.

The first discussion is the sample size. Although the sample size was 618 respondents, it is still small for multiple group analysis. However, a sample size that bigger than 600 may consume more time and probably financial resource than a research plan. It might benefit in clearer results of both a qualitative and a quantitative approaches.

The second limitation is the happening of discriminant validity issue. The quantitative outcomes were not so clear since the two intentions were mixed. The individual acceptance phase and green organization phase become one. At least, Perceived Green Policy is still on the green organization phase. This study warns that future research should be more careful when there are more than one intention predictors in a framework. In case of insufficient discriminant validity, if dropping or combining are not good resolutions, single-indication conversion should solve the issue.

5.4 Future Research and Implication for Stakeholders

5.4.1 Future Research

This research explored some areas of environmental friendly research. The discovery was proved that whenever a researcher composes a hypothesis, a comparison between groups may enlarge a result. A hypothesis, especially powered by regression analysis, might be rejected. This study exemplifies Social Influence (SI), which is a factor, as a case study. Without grouping respondents, social impact was not significant to the endogenous factor (GIP + ISG), therefore the rejected hypothesis. With grouping respondents, it was significant to the women and bachelor's degree graduates. The rejected hypothesis turned into partially accepted. With this example in mind, a researcher may be blind without multiple group analysis. Furthermore, the greater amount of respondents will make multiple group analysis clear.

This research framework will be more fruitful if it takes into larger sample size or different cultures. Such comparison is required. Previously, the qualitative result exhibits interesting dimensions for a future study, which are family influences and governmental influences. The two factors, which were discovered in the qualitative analysis, may help researchers to better understand such study context.

Studies of green IT product adoption/acceptance are needed. As suggested by many meta-analysis articles, study frameworks are not solidified yet, and need various theories for theoretical strengthening. Well-conducted mixed method study will allow investigators to see a bigger picture of the context. Using a quantitative method alone may not allow reading respondents' mind. A longitudinal study is also welcome.

Not only green IT acceptance of consumers, but also green IT acceptance in organizational context needs more researches. Relationships between green organizational policy and other intention predictors are challenges but worthy. They will provide much benefit to management information system and other knowledge fields.

In closing, all discovered relationships, both significant and insignificant, are benefits to study fields. Researcher should try more a specific green IT product if it makes respondents more comprehensible. Although the result may be not

groundbreaking, this endeavor possibly helps public and private sectors to understand if they concern consumer shopping behavior.

5.4.2 Implication for Stakeholders

Firstly, Thai businesses and government should be praised for their long-term efforts. There is environmental knowledge disseminated almost everywhere, for example, a street billboard, a poster in a shopping mall, a sticker on a lavatory mirror, a paper pad plate in a restaurant, and so on. In contrast, there are some curiosities, for example, why some Thai people still do not know characteristics of a green IT product? And why employees in the same workplace have different perspectives of environmental policy?

This research determines that there are three environmental stakeholders to be suggested. The one is household sector and the others are businesses and a government. All suggestions and discussions are motivated by descriptive statistic, quantitative and qualitative results.

Household

The great sustainable development starts from a family context. A society must grow the green heart before a tree. All public and private actions are in vain without a support from households. Elders teach younger family members. This means ‘green instilling’. In other words, it is environmental knowledge dissemination. Start with easy step, such as a household waste segregation and water/energy saving. This will be the beginning of sustainable development.

Businesses

The finding of this research guides companies, especially technology product manufacturers and distributors, to answer these following question: (1) what makes green IT benefit realized by Thai people, and how? and (2) what catches people eyes on environmental image of a firm, and how?

The first question relates to ‘what is consumers’ want’. According to quantitative and qualitative results, consumers want to pay less but get more. That is how a red discount sign attracts people. However, there are costs of environmental practices that consumers seldom pay attention. Selling a green product at a low price will bring a business suffering. A business has environmental practice costs to pay, but

consumers may not see worthiness of green IT product yet. Therefore, green businesses should ask a government for assistance. All governmental supports should be long-term campaigns. For example, green IT products promotion, financial support as a reward of eco-friendliness of a firm, green enhancement in the education system and so on.

For businesses, although Corporate Environmental Responsibility (CER) is publicly presented, consumers still question about genuineness. From qualitative outcomes, some people believe that the green image can be a camouflage. Hence, all good attempts will be in vain. Again, governmental assistance is needed to power up businesses' environmentally friendly performance. In the meantime, businesses must maintain and improve their CER at all times. Businesses must encourage employees to have environmental awareness. For example, businesses must have a monthly competition of environmental friendliness among departments. Once a bad environmental activity of a firm has been caught by consumers, good reputation will be collapsed. A good CER came from a good Corporate Social Responsibility (CSR), which powered by Personal Social Responsibility (PSR) (Kurkoon et al., 2018).

This research found that, sometimes, employees have no concern about availability of organizational policy, especially environmental policies. A counter-question will be "are employees satisfied with their job?" In this case, it relates to a job satisfaction. Employees will easily obey their workplace policies when the job satisfaction is reached their requirements. Consequently, employees will absorb the green policies of a firm.

The important question is 'what makes Thai Label No.5 unforgettable to Thai people?' As mentioned before, it was well planned propaganda. In the late 1980s, a television was the most powerful channel for message dissemination. The public sector released amusing advertising to televisions. The gist was natural resource efficiency. The right distribution channel and the enjoyment brought great success to the environmental friendly campaigns. Therefore, businesses have to learn and adapt from the history. Without the appropriateness, an advertisement will be disregarded. Today, a television is replaced by the Internet. Unlike a television, the internet is wider, faster and more dynamic. Online communities are the better place to start some smart green-

imaged business announcements. Ultimately, the vital factor that forces people to accept green behaviors is perceived green benefits (e.g., reducing electricity charge).

According to descriptive statistic result, there is no or less attraction by hiring famous people to promote technology products, especially green IT products. This is not in line with many studies. When comparing with to the other social elements, workplace and family cultures have stronger influence. Businesses and a government may squander their money and time hiring celebrities to promote eco-friendly merchandises or to greening image of a firm. Instead of hiring celebrities, senses of humor in advertising may trigger people's memorizing. In addition, evidences of environmental tragedies (e.g., pictures of flooding city, pile of waste and a plastic bag consuming turtle) are good reminders and warnings.

A Government

For the public sector, people are already mindful of environmental situations, but they still need a direction. People's awareness is fuel that needs combustion, metaphorically saying. Education system is always a good environmental knowledge disseminator as well as family. Many parents are counting on the education system for resourcefulness of their children. All children, even adults, should be taught knowledge of environmental conservation.

Advertising is important to the knowledge disseminator, not only for business, but also the government. Nowadays, persuasion for green lifestyle in media is rarely to be seen. The success of Thai green label No.5 is previously discussed in this dissertation. The government should continue and improve such campaigns for the greater good of the nation.

A powerful tool that can protect the environment is law. As many respondents suggested that the environmental regulation may not be strong enough to stop illegal deforestation. In addition, law is not only for a punishment, but it also encourages and supports a good corporate. The public sector should support CSRs and keep tracking their good progresses.

Cooperation of All Sectors

As discoursed, three different stakeholders (business, the government and household) have to support each other in respect to environmental protection. Actions

from one stakeholder will influence the others, more or less. Some influences among stakeholders are depicted in figure 5.1.

A green family teaches children environmental friendliness. For example, waste segregation and energy saving. The family will have green purchasing behavior. If many households have green purchasing behavior, a government and businesses perceive opportunities to promote green products/services. A government may increase/improve environmental regulations. Businesses may green their images to attract green buyers and educate their employees green behaviors. A government will make the greener education system, which help people generate green purchasing/use behavior. A government may reward both consumers and businesses for their eco-friendliness. At this point, consumers, businesses and a government will continue their environmental friendly practices. A social sustainable development will happen.

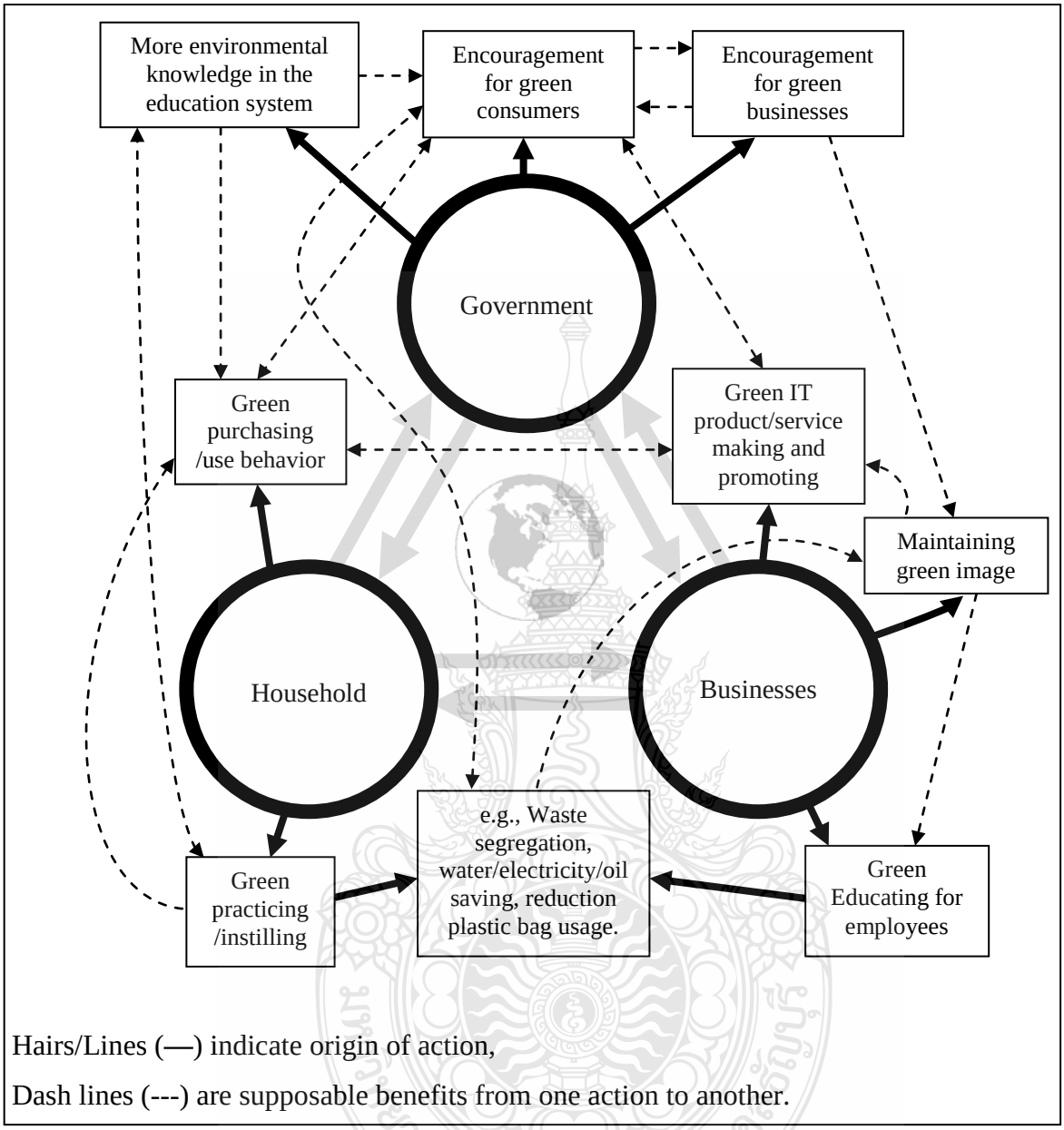


Figure 5.1 Partial brief of all sectors and presumable impact

List of Bibliography

A001113, Decimal expansion of e. In ***the On-line Encyclopedia of Integer Sequences (OEIS).*** Retrieved from https://oeis.org/A001113

Abdullah, M., Al-Nasser, A. & Husain, N. (2000). Evaluating Functional Relationship between Image, Customer Satisfaction and Customer Loyalty Using General Maximum Entropy. ***Total Quality Management, 11***(6), 826-829.

Aberdeen Group. (2008). ***Going Green: When "Making a Difference" Aligns with Market Demand.*** Retrieved from: http://www.marketingpower.com/ResourceLibrary/ Documents/Content Partner Documents/Aberdeen Research/Going_Green.pdf

Adorisio, A. L. M. (2008). Living among stories: everyday life at a South Western bank. ***Journal of Organizational Change Management, 21***(5), 610-21.

Agarwal, N., Lim, M., & Wigand, R. T. (2012). Raising and Rising Voices in Social Media - A Novel Methodological Approach in Studying Cyber-Collective Movements. ***Business & Information Systems Engineering, 4***(3), 113-126.

Ajzen, I. (1991). The Theory of Planned Behavior, ***Organizational Behavior and Human Decision Processes, 50,*** 179–211.

Ajzen, I. & Fishbein, M. (1980). ***Understanding Attitudes and Predicting Social Behavior.*** Englewood Cliffs, NJ: Prentice-Hall.

Alzahrani, M. E. & Goodwin, R. D. (2012). Towards a UTAUT-based Model for the Study of E-Government Citizen Acceptance in Saudi Arabia, ***World Academy of Science, Engineering and Technology, 64,*** 8-14.

Ambec, S. & Lanoie, P. (2008). Does it Pay to be Green? A Systematic Overview. ***Academy of Management Perspectives, 22***(4), 45-62.

Angsuchoti, S., Wijitwanna, S., & Pinyopanuwat, R. (2011). ***Statistical Analysis for social and behavior research: Technical use of LISREL*** (3rd ed.). Bangkok, BKK: โรงพิมพ์เจริญดีมั่นคงการพิมพ์ [Thai].

Anthony, C. C. (2015, Apr 16). H.B. group rewards businesses that take the no-styrofoam challenge. ***McClatchy - Tribune Business News.*** Retrieved from http://search.proquest.com/docview/1673630844?accountid=32078

Arbore, A., Soscia, I. & Bagozzi, R. P. (2014). The Role of Signaling Identity in the Adoption of Personal Technologies. ***Journal of the Association for Information Systems, 5***(2), 86-110.

Arnocky, S., Dupuis, D., & Stroink, M. L. (2012). Environmental concern and fertility intentions among canadian university students. ***Population and Environment, 34***(2), 279-292. doi: http://dx.doi.org/10.1007/s11111-011-0164-y

AVISO^{+}. (2015). ***Mean Sea Level Rise.*** Retrieved from: http://www.aviso.altimetry.fr/en/data/products/ocean-indicators-products/mean-sea-level.html

Baldé, C.P., Wang, F., Kuehr, R., & Huisman, J. (2015). ***The global e-waste monitor 2014.*** Retrieved from http://i.unu.edu/media/unu.edu/news/52624/UNU-1stGlobal-E-Waste-Monitor-2014-small.pdf

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. ***Psychological Review, 84***(2), 191–215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. ***American Psychologist, 37***(2), 122–147.

Bandura, A. (1989). Social Cognitive Theory. In R. Vasta (Ed.), ***Annals of child development: Six theories of child development (Vol.6),*** 1–60, Greenwich: JAI Press.

Bandyopadhyay, K. & Fraccastoro, K. A. (2007). The Effect of Culture on User Acceptance of Information Technology. ***Communications of the Association for Information Systems, 19,*** 522-543.

Banerjee, A., & Solomon, B.D. (2003). Eco-Labeling for Energy Efficiency and Sustainability: A Meta-Evaluation of US Programs. ***Energy Policy, 31***(1), 109–123.

Barrett, P. (2007). Structural equation modeling: Adjudging model fit. ***Personality and Individual Differences, 42***(5), 815-824. doi: http://dx.doi.org/10.1016/j.paid.2006.09.018

Branco, M. C., & Rodrigues, L. L. (2006). Corporate social responsibility and resource-based perspective, ***Journal of Business Ethics, 69***(2), 111-132.

Barnett, M., Jermier, J., & Lafferty, B. (2006). Corporate reputation: The definitional landscape. ***Corporate Reputation Review, 9***(1), 26–38.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. ***Journal of Management, 17***(1), 99-120.

Barney, J. B. & Arikan, A. M. (2006). The Resource-based View: Origins and Implications. ***Handbook of Strategic Management,*** forthcoming.

Baumann, H., Boons, F., & Bragd, A. (2002). Mapping the Green Product Development Field: Engineering, Policy and Business Perspectives. ***Journal of Cleaner Production, 10***(5), 409–425.

Becker, M. H., Radius, S. M., Rosenstock, I. M., Drachman, Schuberth, K. C., & Teets, K. C. (1978). Compliance with a Medical Regimen for Asthma: a Test of the Health Belief Model. ***Public Health Reports, 93***(3), 268-277.

Becker-Olsen, K., Cudmore, B. A., & Hill, R. P. (2006). The impact of perceived corporate social responsibility on consumer behavior. ***Journal of Business Research, 59***(1), 46-53. Retrieved from http://search.proquest.com/docview/196328218?accountid=32078

Beinhocker, E., Oppenheim, J., Irons, B., Lahti, M. Farrell, D., Nyquist, S., Remes, J., Nauclér, T., & Enkvist, P.-A. (2008). ***The Carbon Productivity Challenge: Curbing Climate Change and Sustaining Economic Growth*****.** McKinsey Global Institute, McKinsey & Company. Retrieved from http://www.mckinsey.com/insights/energy_resources_materials/the_carbon_productivity_challenge

Bellenger, D. N., Steinberg, E., & Stanton, W. W. (1976). The congruence of store image and self image. ***Journal of Retailing, 52***(1), 17–32.

Berndt, A., & Gikonyo, L. (2012). Environmental Concern Behaviours in Africa: An Exploratory Study. ***Journal of Management and Sustainability, 2***(2), 1-10.

Retrieved from http://search.proquest.com/docview/1053331665?accountid=32078

Bhattacherjee, A., & Sanford, C. (2006). Influence Processes for Information Technology Acceptance: An Elaboration Likelihood Model. ***MIS Quarterly, 30***(4), 805-825.

Briody, E., Pester, T. M., & Trotter, R. (2012). A story's impact on organizational-culture change. ***Journal of Organizational Change Management, 25***(1), 67-87.

Brown, S. A., & Venkatesh, V. (2005). Model of Adoption of Technology in Households: A Baseline Model Test and Extension Incorporating Household Life Cycle. ***MIS Quarterly 29***(3), 399-426.

Bryan, S. (2015, Apr 02). Hallandale may ban styrofoam products from beach, other public spots. ***McClatchy - Tribune Business News.*** Retrieved from http://search.proquest.com/docview/1668378903?accountid=32078

Brønn, P. S. & Vrioni, A. B. (2001). Corporate social responsibility and cause-related marketing: an overview. ***International Journal of Advertising, 20,*** 207–222.

Budworth, M. (2011). Individual learning and group performance: The role of collective efficacy. ***Journal of Workplace Learning, 23***(6), 391-401. doi:http://dx.doi.org/10.1108/13665621111154403

Cameron, K. S., & Quinn, R. E. (2011). ***Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework*** (3rd ed.). San Francisco, CA: Jossery-Bass.

Chadcham, S. (2004). Confirmatory Factor Analysis. ***Journal of Educational Research and Measurement, 2***(1), 15-42.

Chan, E. S. W. (2013a). Gap Analysis of Green Hotel Marketing. ***International Journal of Contemporary Hospitality Management, 25***(7), 1017-1048.

Chan, E. S. W. (2013b). Managing Green Marketing: Hong Kong Hotel Managers' Perspective. ***International Journal of Contemporary Hospitality Management, 34,*** 442-461.

Chan, K. Y., Gong, M., Xu, Y., & Thong, J. Y. L. (2008). ***Examining User Acceptance of SMS: An Empirical Study in China and Hong Kong,*** Paper presented

at the 12th Pacific Asia Conference on Information System, Suzhou, China. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1281&context=pacis2008

Chang, C., & Cheng, Z. (2015). Tugging on heartstrings: Shopping orientation, mindset, and consumer responses to cause-related marketing. ***Journal of Business Ethics, 127***(2), 337-350. doi:http://dx.doi.org/10.1007/s10551-014-2048-4

Chang, C.-H. & Tu, C.-Y. (2005). Exploring Store Image, Customer Satisfaction and Customer Loyalty Relationship: Evidence from Taiwanese Hypermarket Industry. ***The Journal of American Academy of Business, 7***(2), 197–202.

Chang, N.-J. & Fong, C.-M. (2010). Green Product Quality, Green Corporate Image, Green Customer Satisfaction, and Green Customer Loyalty. ***African Journal of Business Management, 4***(13), 2836-2844.

Charoensuthipan, P. & Fredrickson, T. (2014). ***Q-mark: not a guarantee of food safety.*** Retrieved 20 August 2014, from http://www.bangkokpost.com/learning/learning-from-news/427529/q-mark-not-a-guarantee-of-food-safety.

Chen, Y. J., & Sheu, J.-B. (2009). Environmental-Regulation Pricing Strategies for Green Supply Chain Management. ***Transportation Research Part E: Logistics and Transportation Review, 45***(5), 667–677.

Chin, W. W. (1998). Issues and Opinion on Structural Equation Modeling. ***MIS Quarterly, 22***(1), 1-14.

Claydon, J. (2011). A new direction for CSR: the shortcomings of previous CSR models and the rationale for a new model. ***Social Responsibility Journal, 7***(3), 405-420.

Clement, P. (2013). Consumer education in a developing country: The use of a stratified random sample survey**.** ***International Journal of Management, 30***(2), 434-450. Retrieved from http://search.proquest.com/docview/1367068873?accountid=32078

Cogoy, M. (2010). Consumption, time and the environment. ***Review of Economics of the Household, 8***(4), 459-477.

Coleman, J. S. (1986). Social Theory, Social Research, and a Theory of Action. ***American Journal of Sociology, 91,*** 1309-1335.

Creswell, J. W. (2016). ***30 Essential Skills for the Qualitative Researcher*****.** Thousand Oaks, CA: Sage Publications.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. ***MIS Quarterly, 13***(3), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. ***Management Science, 35***(8), 982-1003.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. ***Journal of Applied Social Psychology, 22,*** 1111–1132.

Dawkins, J. (2004). Corporate responsibility: The communication challenge. ***Journal of Communication Management, 9***(2), 108-119. Retrieved from http://search.proquest.com/docview/232918986?accountid=32078

Dedrick, J. (2010). Green IS: Concepts and Issues for Information Systems Research. ***Communications of the Association for Information Systems, 27***(1), 173-184.

DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. ***Information Systems Research, 3***(1), 60-95.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. ***Management Information Systems, 19***(4), 9-30.

Demsetz, H. (1967). Towards a Theory of Property Rights. ***American Economic Review, 57***(2), 347-359.

Diamantopoulos, A., Schlegelmilch, B. B., Sincovics, R. R., & Bohlen, G. M. (2003). Can Socio-Demographics Still Play a Role in Profiling Green Consumers? A Review of the Evidence and an Empirical Investigation. ***Journal of Business Research, 56***(6), 465–480.

Diamantopoulos, A., & Siguaw, A. D. (2000). ***Introducing LISREL: A guide for the uninitiated*****.** London, LD: Sage Publications.

DiPietro, R. B., Cao, Y., & Partlow, C. (2013). Green Practices in Upscale Foodservice Operations. ***International Journal of Contemporary Hospitality Management, 25***(5), 779-796. Retrieved from http://search.proquest.com/docview/1398041960?accountid=32078

Dlugokencky, E., & Tans, P. (2017). ***Trends in Atmospheric Carbon Dioxide.*** Retrieved from: https://www.esrl.noaa.gov/gmd/webdata/ccgg/trends/co2_trend_mlo.png

Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of Price, Brand, and Store Information on Buyers. ***Journal of Marketing Research, 28***(3), 307-319.

Dohan, M. S. & Tan, J. (2014). Enhancing Patient Physician Communication with Electronic Symptom Reporting (ESR): A Multilevel Model. ***Communications of the Association for Information Systems, 34***(1), 407-418.

Dunlap, R. E. & Van Liere, K. D. (1978). The New Environmental Paradigm. ***Journal of Environmental Education, 9(***1), 10-19.

Dunlap, R. E., Van Liere, K. D., Mertig, G. A., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. ***Journal of Social, 56,*** 425-442.

Essawi, M. (2012). Changing organizational culture through constructive confrontation of values. ***Journal of Organisation and Human Behaviour, 1***(2), 46-50. Retrieved from http://search.proquest.com/docview/1478026055?accountid=32078

Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). ***Journal of Business Research, 63***(3), 324-327.

Fishbein, M., & Ajzen, I. (1975). ***Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research.*** Reading, MA: Addison-Wesley.

Fischer, C. (2008). Feedback on household electricity consumption: A tool for saving energy? ***Energy Efficiency, 1***(1), 79-104. doi:http://dx.doi.org/10.1007/s12053-008-9009-7

Fournier, G. (2010). Reaction Formation. ***Psych Central.*** Retrieved on September 14, 2015, from http://psychcentral.com/encyclopedia/2009/reaction-formation-2/

Freeman, R. E. (2010). ***Strategic Management: A Stakeholder Approach.*** New York, NY: Cambridge University Press.

Freundlieb, M., & Teuteberg, F. (2012). Augmented Sustainability Reports: A Design Science Approach. ***AIS Transactions on Human-Computer Interaction, 4***(4), 230-247.

Fuchs, C. (2008). The Implications of New Information and Communication Technologies for Sustainability. ***Environmental Development and Sustainability, 3***(10), 291-309.

Fuchs, C., & Diamantopoulos, A. (2009). Using single-item measures for construct measurement in management research. ***Die Betriebswirtschaft, 69***(2), 195-210.

Furnham, A. (2012). ***50 Ideas You Really Need to Know: Psychology.*** London, LD: Quercus.

Futrell, C. M. (2011). ***Fundamentals of Selling: Customers for Life Through Service*** (12th ed.). New York, NY: McGraw-Hill/Irwin.

Gaskin, J. (2016a). Re: ***SEM Series (2016) 5. Confirmatory Factor Analysis Part 2*** [Video file]. Retrieved from https://www.youtube.com/watch?v=CFBUECZgUuo

Gaskin, J. (2016b). Re: ***Model fit during a Confirmatory Factor Analysis (CFA) in AMOS*** [Video file]. Retrieved from https://www.youtube.com/watch?v=JkZGWUUjdLg

Gaskin, J. (2016c). ***X2 Difference,*** **Stats Tools Package** [XLSM file]. Retrieved from http://statwiki.kolobkreations.com

Gaskin, J. (2016d). ***2 way interactions,*** **Stats Tools Package** [XLSM file]. Retrieved from http://statwiki.kolobkreations.com

Gaskin, J. (2016e). Re: ***SEM Series (2016) 10. Multigroup Analysis*** [Video file]. Retrieved from https://www.youtube.com/watch?v=w5ikoIgTIc0

Gavronski, I., Klassen, R. D., Vachon, S., & Nascimento, L. F. M. D. (2011). A resource-based view of green supply management. ***Transportation Research Part E., 47,*** 872-885. doi:10.1016/j.tre.2011.05.018.

Gefen, D., Straub, D. W., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. ***Communications of the Association for Information Systems, 4,*** 1-77.

Ghemawat, P. (1986). Sustainable advantage, ***Harvard Business Review, 64,*** 53-58.

Gilg, A., Barr, S., & Ford, N. (2005). Green Consumption or Sustainable Lifestyles? Identifying the Sustainable Consumer. ***Futures, 37,*** 481-504.

Gkorezis, P., Hatzithomas, L., & Petridou, E. (2011). The Impact of Leader's Humor on Employees' Psychological Empowerment: the Moderating Role of Tenure. ***Journal of Managerial Issues, 23***(1), 83-95.

Glanz, K., Rimer, B., & Viswanath, K. (2008). ***Health Behavior and Health Education - Theory, Research, and Practice*** (4th ed.). San Francisco, CA: Wiley.

Godinho de Matos, M., Ferreira, P., & Krackhardt, D. (2014). Peer Influence in The Diffusion Of iPhone 3g Over a Large Social Network. ***MIS Quarterly, 38***(4), 1103-1133.

Goh, K.-Y., & Ping, J. W. (2014). Engaging Consumers with Advergames: An Experimental Evaluation of Interactivity, Fit and Expectancy. ***Journal of the Association for Information Systems, 15***(7), 388-421.

Gottschalk, I., & Kirn, S. (2013). Cloud Computing As a Tool for Enhancing Ecological Goals?. ***Business & Information Systems Engineering, 5***(5), 299-313.

Griffin, D. H., Fischer, D. P. & Morgan, M. T. (2001). ***Testing an Internet Response Option for the American Community Survey.*** Paper presented at the annual conference of the American Association for Public Opinion Research Montreal, Quebec, Canada. Retrieved from www.census.gov/acs/www/Downloads/library/2001/2001_Griffin_01.pdf

Grimmer, M., & Bingham, T. (2013). Company environmental performance and consumer purchase intentions, ***Journal of Business Research, 66***(10), 1945-1953.

Gürlük, S. (2013). Use of some components of new ecological paradigm scale on congestion pricing in a recreation area. ***Journal of Environmental Planning and Management, 56***(10), 1468. Retrieved from http://search.proquest.com/docview/1458361191?accountid=32078

Habib, A., Idrees, A., & Kursheed, A. (2010). Factors in Environmental Advertising Influencing Consumer's Purchase Intention. ***European Journal of Scientific Research, 48***(2), 217-226.

habit [Def. 1 & Def. 3]. (n.d.). In ***Dictionary.com,*** Retrieved August 27, 2015, from http://dictionary.reference.com/browse/habit.

Hanson, C. B. (2013). Environmental Concern, Attitude toward Green Corporate Practices, and Green Consumer Behavior in the United States and Canada. ***ASBBS E - Journal, 9***(1), 62-70. Retrieved From http://Search.Proquest.Com/Docview/1448005670?Accountid=32078

Hao, L., & Fan, M. (2014). An Analysis of Pricing Models in the Electronic Book Market. ***MIS Quarterly, 38***(4), 1017-1032.

Hargadon, A. B., & Bechky, B. A. (2006). When collections of creatives become creative collectives: A field study of problem solving at work. ***Organization Science, 17***(4), 484-500,525. Retrieved from http://search.proquest.com/docview/213831764?accountid=32078

Hart, S. L. (1994). How Green Production Might Sustain the World. ***Journal of the Northwest Environment, 10,*** 4-14.

Hart, S. L. (1995). A Natural-Resource-Based View of the Firm. ***Academy of Management Review, 20***(4), 986-1014.

Hart, S. L. (2005). Innovation, Creative Destruction and Sustainability. ***Research-Technology Management, 48***(5), 21-27.

Hart, S. L., & Ahuja, G. (1996). A Does It Pay To Be Green?: An Empirical Examination of the Relationship Between Pollution Prevention and Firm Performance. ***Business Strategy and the Environment, 5,*** 30-37.

Hartmann, P., & Apaolaza Ibáñez, V. (2012). Consumer Attitude and Purchase Intention toward Green Energy Brand: The Role of Psychological Benefits and Environmental Concern. ***Journal of Business Research, 65***(9), 1254-1263.

Hartmann, P., Apaolaza Ibáñez, V., & Sainz, F. J. F. (2005). Green Branding Effects on attitude: functional versus emotional positioning strategies. Departamento de Economý´a de la Empresa y Financiacio´n, Universidad del Paý´s Vasco,

Bilbao, Spain. ***Journal Marketing Intelligence & Planning, 23***(1), 9–29. http://dx.doi.org/10.1108/02634500510577447

Haryanto, B. (2014). The Influence of Ecological Knowledge and Product Attributes in Forming Attitude and Intention to Buy Green Product. ***International Journal of Marketing Studies, 6***(2), 83-91.

Harvey, J. W. (1990). Benefit segmentation for fund raisers. ***Journal of the Academy of Marketing Science, 18***(1), 77–86

Hatch , M. J., & Shultz , M. (2001). Bringing the corporation into corporate branding. ***European Journal of Marketing, 37***(7-8), 1041 – 1064.

Hawabhay, B. B., Abratt, R., & Peters, M. (2009). The role of corporate communications in developing a corporate brand image and reputation in mauritius. ***Corporate Reputation Review, 12***(1), 3-20. doi:http://dx.doi.org/10.1057/crr.2009.4

Hedlund, T. (2011). The Impact of Values, Environmental Concern, and Willingness to Accept Economic Sacrifices to Protect the Environment on Tourists' Intentions to Buy Ecologically Sustainable Tourism Alternatives. ***Tourism and Hospitality Research, 11***(4), 278-288. doi: 10.1177/1467358411423330

Hellriege, D., & Slocum Jr., J. W. (2010). ***Organizational Behavior*** (13th ed.). Mason, OH: South-Western Cengage Learning.

Hennig-Thurau, T., & Klee, A. (1997). The Impact of Customer Satisfaction and Relationship Quality on Customer Retention: A Critical Reassessment and Model Development. ***Psychology & Marketing, 14***(8), 737-764.

Herbes, C., & Ramme, I. (2014). Online Marketing of Green Electricity in Germany – A Content Analysis of Providers' Websites. ***Energy Policy, 66,*** 257-266.

Hill, J. P. (2011). Faith and Understanding: Specifying the Impact of Higher Education on Religious Belief. ***Journal for the Scientific Study of Religion, 50***(3), 533-551. doi:10.1111/j.1468-5906.2011.01587.x

Hitt, M. A., Ireland, R. D. & Hoskisson, R. E. (2001). ***Strategic Management Competitiveness and Globalization*** (4th ed.). Cincinnati, OH: South-Western College Publishing.

Holbrook, M. B., & Moore, W. L. (1981). Feature interactions in consumer judgments of verbal versus pictorial presentations. ***Journal of Consumer Research, 8***(1), 103–13. http://dx.doi.org/10.1086/208846

Hong, S., & Tam, K. Y. (2006). Understanding the adoption of multipurpose information appliances: The case of mobile data services. ***Information Systems Research, 17***(2), 162-179.

Hsu, J. L., & Lin, T. (2015). Carbon reduction knowledge and environmental consciousness in Taiwan. ***Management of Environmental Quality, 26***(1), 37. Retrieved from http://search.proquest.com/docview/1648112748?accountid=32078

Hu, H., Al-Gahtani, S. S., & Hu, P. J.-H. (2013). Examining the Moderating Role of Gender in Arabian Workers' Acceptance of Computer Technology. ***Communications of the Association for Information Systems, 33***(1), 47-66.

Husted, B. W., & Allen, D. B. (2007). Strategic corporate social responsibility and value creation among large firms lessons from the Spanish experience. ***Long Range Planning, 40***(6), 594-610.

Ishaswini, & Datta, S. K. (2011). Pro-environmental Concern Influencing Green Buying: A Study on Indian Consumers. ***International Journal of Business and Management, 6***(6), 124-133. Retrieved from http://search.proquest.com/docview/872115903?accountid=32078

Jackson, S. L. (2009). ***Research Methods and Statistics: A Critical Thinking Approach*** (3rd ed.). Belmont, CA: Wadsworth Cengage Learning.

Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: A Decade Later. *Health Education Quarterly, 11*(1), 1-47.

Jessup, L., & Valacich, J. (2008). ***Information Systems Today Managing in the Digital World*** (3rd ed.). New Jersey, NJ: Pearson Education.

Jha, A. K., Bloch, R. & Lamond, J. (2011). ***Cities and Flooding a Guide to Integrated Urban Flood Risk Management for the 21st Century*****.** Washington, DC: The World Bank.

Johansson, G., & Winroth, M. (2010). Introducing Environmental Concern in Manufacturing Strategies. ***Management Research Review, 33***(9), 877-899. doi:10.1108/01409171011070305

Johnson, S. B., Blum, R. W., & Giedd, J. N. (2009). Adolescent Maturity and the Brain: The Promise and Pitfalls of Neuroscience Research in Adolescent Health Policy**.** ***The Journal of Adolescent Health □: Official Publica Society for Adolescent Medicine, 45***(3), 216–221. http://doi.org/10.1016/j.jadohealth.2009.05.016

Jonathan, D., Wagner, T. M., Hess, T., & Benlian, A. (2013). Music as a Service as an Alternative to Music Piracy? - An Empirical Investigation of the Intention to Use Music Streaming Services. ***Business & Information Systems Engineering, 5***(6), 383-396.

Jones, A., & Posnett, J. (1991). Charitable donations by UK households: Evidence from the family expenditure survey. ***Applied Economics, 23***(2), 343–351.

Jones, C. J., Smith, H., & Llewellyn, C. (2013). Evaluating the effectiveness of health belief model interventions in improving adherence: a systematic review. ***Health Psychology Review, 8***(3), 1-17.

Jones, G. R. (1983). Transaction Costs, Property Rights, and Organizational Culture: An Exchange Perspective. ***Administrative Science Quarterly, 28***(3), 454-467.

Jones, G. R. (2001). ***Organizational Theory: Text and Cases*** (3rd ed.). New Jersey, NJ: Prentice Hall.

Joshi, S. (2000). Product Environmental Life-Cycle Assessment Using Input-Output Techniques. ***Journal of Industrial Ecology, 3***(2-3), 95-119.

Jónás, T. (2007). Sigmoid functions in reliability based management. Periodica Polytechnica. ***Social and Management Sciences, 15***(2), 67-72. doi:http://dx.doi.org/10.3311/pp.so.2007-2.04

Juwaheer, T. D., Pudaruth, S., & Noyaux, M. M. E. (2012). Analyzing the Impact of Green Marketing Strategies on Consumer Purchasing Patterns in Mauritus. ***World Journal of Entrepreneurship, Management and Sustainable Development, 8***(1), 36-59.

Jöreskog, K. G., & Sörbom, D. (1993). ***LISREL8: Structural Equation Modeling with the SIMPLIS Command Language.*** Lincoinwood, IL: Scientific Software International Inc.

Jöreskog, K. G., & Sörbom, D. (1996). ***LISREL8: User's Reference Guide.*** Lincoinwood, IL: Scientific Software International Inc.

Kaenzig, J., Heizle, S. L., & Wüstenhagen, R. (2013). Whatever the Customer Wants, the Customer Gets? Exploring the Gap between Consumer Preferences and Default Electricity Products in Germany. ***Energy Policy, 53***(1), 311–322.

Kaiyawan, Y. (2013). ***Analyze Structural Equation Model (SEM) with AMOS.*** Bangkok, BKK: Chulalongkorn University Bookshop.

Karanja, E., Zaveri, J. & Ahmed, A. (2013). How Do MIS Researchers Handle Missing Data in Survey-Based Research: A Content Analysis Approach. ***International Journal of Information Management, 33,*** 734-751.

Kenny, D. A. (2016, April 9). ***Multiple Latent Variable Models: Confirmatory Factor Analysis.*** Retrieved from http://davidakenny.net/cm/mfactor.htm

Khedhaouria, A., Beldi, A., & Belbaly, N. (2013). The moderating effect of gender on continuance intention for mobile Internet services (MIS). ***Systèmes d'Information et Management, 18***(3), 117-137.

Khojastehpour, M., & Johns, R. (2014). The effect of environmental CSR issues on corporate/brand reputation and corporate profitability. ***European Business Review, 26***(4), 330. Retrieved from http://search.proquest.com/docview/1658770990?accountid=32078

Kim, J., & Connolly, D. (2012). ***How IT Can Go Green.*** Retrieved August 14, 2013 from http://hospitalitytechnology.edgl.com/top-stories/How-IT-Can-Go-Green78245.aspx

Kim, S. S., Malhotra, N. K., & Narasimhan, S. (2005). Two Competing Perspectives on Automatic Use: A Theoretical and Empirical Comparison. ***Information Systems Research, 16***(4), 418-432.

Kim, Y. & Choi, S. M. (2005). Antecedents of Green Purchase Behavior: An Examination of Collectivism, Environmental Concern, and PCE. ***Advances in Consumer Research, 32***(1), 592-599

Kopnina, H. (2012). 'People are not plants, but both need to grow': Qualitative analysis of the new ecological paradigm scale for children. ***Environmentalist, 32***(4), 394-404. doi:http://dx.doi.org/10.1007/s10669-012-9401-x

Korchia, M. (2010). ***SEM Stats (version 1.3)*** [XLS file]. Retrieved from http://www.watoowatoo.net/sem/sem.html

Kotler, P., Hessekiel, D. & Lee, N. R. (2012). ***Good Works! Marketing and Corporate Initiatives that Build a Better World… and the Bottom Line*****.** Hoboken, NJ: Wiley.

Kozlowski, S. W. J., & Salas, E. (1997). A multilevel organizational systems approach for the implementation and transfer of training. In J. K. Ford, S. W. J. Kozlowski, K. Kraiger, E. Salas & M. Teachout (Eds.), ***Improving Training Effectiveness in Work Organizations*** (pp. 247-287.). Erlbaum, NJ: Mahwah.

Knox, S., & Maklan, S. (2004). Corporate social responsibility: moving beyond investment towards measuring outcomes. ***European Management Journal, 22***(5), 508-516.

Kurkoon, P., Pimchangthong, D., & Boonjing, V. (2014). ***Conceptual Framework for Employment Paradox: Attitudes of Thai Business People*****.** Paper presented at Multidisciplinary Trends in Academic Research, Bangkok. Retrieved from http://www.globalilluminators.org/wp-content/uploads/2014/10/MTAR-14-211.pdf

Kurkoon, P., Pimchangthong, D., & Boonjing, V. (2018). Driving Corporate Social Responsibility via Personal Social Responsibility. ***International Journal of Applied Business & Economic Research,*** Manuscript accepted for publication.

Lamberti, L., & Lettieri, E. (2009). CSR practices and corporate strategy: evidence from a longitudinal case study. ***Journal of Business Ethics, 87***(2), 153-168.

Lamboy, T. (2011). Corporate social responsibility: sustainable water use. ***Journal of Cleaner Production, 19***(8), 852-866.

Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The Technology Acceptance Model: Past, Present, and Future. ***Communication of the Association for Information Systems, 12,*** 752-780.

Lehesvirta, T. (2004). Learning processes in a work organization: From individual to collective and/or vice versa? ***Journal of Workplace Learning, 16***(1), 92-100. Retrieved from http://search.proquest.com/docview/198448952?accountid=32078

Limayem, M., Hirt, S. G., & Cheung, C. M. K. (2007). How Habit Limits the Predictive Power of Intentions: The Case of IS Continuance. ***MIS Quarterly, 31***(4), 705-737.

Lewis, T. (2013). ***World's E-Waste to Grow 33% by 2017, Says Global Report.*** Retrieved from http://www.livescience.com/41967-world-e-waste-to-grow-33-percent-2017.html

Luzio, J. P. P., & Lemke, F. (2013). Exploring Green Consumers' Product Demands and Consumption Processes the Case of Portuguese Green Consumers. ***European Business Review, 25***(3), 281-300. doi:10.1108/09555341311314825

Malhotra, A., Melville, N. P., & Watson, R. T. (2013). Spurring Impactful Research on Information Systems for Environmental Sustainability. ***MIS Quarterly, 37***(4), 1265-1274.

Mann, D. (2015, Feb 02). Medford council may ban Styrofoam containers. ***McClatchy - Tribune Business News*** Retrieved from http://search.proquest.com/docview/1650510650?accountid=32078

Marchewka, J. T., Liu, C. & Kostiwa, K. (2007). An Application of the UTAUT Model for Understanding Student Perceptions Using Course Management Software. ***Communications of the IIMA, 7***(2), 93-104.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. ***Psychological Review, 98***(2), 224–253

Martenson, R. (2007). Corporate Brand Image, Satisfaction and Store Loyalty: a Study of the Store as a Brand, Store Brands and Manufacturer Brands. ***International Journal of Retail & Distribution Management, 35***(7), 544–555.

Mason, R. O. (1978) Measuring Information Output: A Communication Systems Approach. ***Information & Management, 1***(5), 219-234.

Mathur, L.K., & Mathur, I. (2000). An Analysis of the Wealth Effects of Green Market Strategies. ***Journal of Business Research, 50***(1), 193-200

McDonald, G. W., & Patterson, M. G. (2007). Bridging the divide in urban sustainability: From human exemptionalism to the new ecological paradigm. ***Urban Ecosystems, 10***(2), 169-192. doi:http://dx.doi.org/10.1007/s11252-006-0017-0

McKinsey & Company. (2014). ***Company leaders and all others increasingly see sustainability as a top CEO priority.*** Retrieved from http://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/sustainabilitys-strategic-worth-mckinsey-global-survey-results

Meckel, M., Walters, D. & Baugh, P. (2005). Mixed-mode Surveys Using Mail and Web Questionnaires. ***The Electronic Journal of Business Research Methodology, 3***(1), 69-80.

Mintzberg, H., Ahlstrand, B. & Lampel, J. (1998). ***Strategy Safari: A Guided Tour through the Wilds of Strategic Management.*** New York, NY: Free Press.

Molla, A. (2008). ***GITAM: A Model for the Adoption of G*** Paper presented at 19th Australasian Conference on Information Systems, Christchurch, New Zealand. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1074&context=acis2008

Molla, A., Cooper, V., & Pittayachawan, S. (2009). ***IT and Eco-Sustainability: Developing and Validating a Green IT Readiness Model.*** Paper presented at 30th International Conference on Information Systems, Seoul, Republic of Korea. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1064&context=icis2009

Molla, A., Cooper, V., & Pittayachawan, S. (2011). The Green IT Readiness (G-Readiness) of Organizations: An Exploratory Analysis of a Construct and Instrument, ***Communications of the Association for Information Systems, 29***(1), 67-96.

Moore, G. C., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. ***Information Systems Research, 2***(3), 192-222.

Munguatosha, G. M., Muyinda, P. B., & Lubega, J. T. (2011). A Social Networked Learning Adoption Model for Higher Education Institutions in Developing Countries. ***On the Horizon, 19***(4), 307-320.

Murugesan, S. (2008). Harnessing Green IT: Principles and Practices. ***IT Professional, 10***(1), 24-33.

Natural Marketing Institute (2008). ***Natural Marketing Institute's 2007 LOHAS Consumer Trends Database*** ^{TM}**.** Retrieved from http://www.environmentalleader.com/ 2008/05/20/green-labels-positively-impact-purchase-behavior/?graph=full

Neuman, W. L. (2011). ***Social Research Methods: Qualitative and Quantitative Approaches*** (7th ed.). Boston, MA: Pearson.

Neville, B. A., Bell, S. J., & Menguc, B. (2005). Corporate reputation, stakeholders and the social performance-financial performance relationship. ***European Journal of Marketing, 39***(9-10), 1184-1198.

Nordlund, A., & Westin, K. (2013). Influence of values, beliefs, and age on intention to travel by a new railway line under construction in northern Sweden. ***Transportation Research Part A: Policy and Practice, 48***(1), 86-95. doi:http://dx.doi.org/10.1016/j.tra.2012.10.008

Oberseder, M., Schlegelmilch, B. B., & Murphy, P. E. (2013). CSR practices and consumer perceptions. ***Journal of Business Research, 66***(10), 1839-1851.

Ogunbode, C. A. (2013). The NEP scale: Measuring ecological attitudes/worldviews in an African context**.** ***Environment, Development and Sustainability, 15***(6), 1477-1494. doi:http://dx.doi.org/10.1007/s10668-013-9446-0

Oh, W., & Lucas Jr., H. C. (2006). Information Technology and Pricing Decisions: Price Adjustments in Online Computer Markets. ***MIS Quarterly, 30***(3), 755-775.

Ojha, A., Sahu, G., & Gupta, M. (2009). Antecedents of Paperless Income Tax Filing by Young Professionals in India: An Exploratory Study. ***Transforming***

Government: People, Process and Policy, 3(1), 65–90. doi:10.1108/17506160910940740

Okada, E. M. (2005). Justification Effects on Consumer Choice of Hedonic and Utilitarian Goods. ***Journal of Marketing Research, 42***(1), 43-53

Oliver, J. D. (2007). ***Increasing the Adoption of Environmentally Friendly Products: Who are the Non-adaptors, and What will Get Them to Buy Green?*** (Doctoral dissertation). Retrieved from ProQuest Digital Dissertations.

Osterwalder. A., Pigneur, Y., & Tucci, C. L. (2005). Clarifying Business Models: Origins, Present, and Future of the Concept. ***Communications of the Association for Information Systems, 16***(1), 1-25.

Ozaki, R. (2011). Adoption Sustainable Innovation: What makes Consumers sign up to Green Electricity?. ***Business Strategy and the Environment, 20***(1), 1-17.

Pahnila, S., Siponen, M., & Zheng, X. (2011). Integrating Habit into UTAUT: the Chinese eBay Case. ***Pacific Asia Journal of the Association for Information Systems, 3***(2), 1-3.

Parjanen, S. (2012). Experiencing Creativity in the Organization: From Individual Creativity to Collective Creativity. ***Interdisciplinary Journal of Information, Knowledge, and Management, 7,*** 109-128.

Park, J., Robertson, R., & Wu, C. (2004). The Effect of Airline Service Quality on Passengers' Behavioral Intentions. ***Journal of Air Transport Management, 10,*** 435-439.

Pearlson, K. E., & Saunders, C. S. (2006). ***Managing & Using Information Systems: A Strategic Approach*** (3rd ed.). Hoboken, NJ: Wiley.

Pehnt, M. (2006). Dynamic life cycle assessment (LCA) of renewable energy technologies. ***Renewable Energy, 31,*** 55–71.

Pernici, B., Aiello, M., vom Brocke, J., Donnellan, B., Gelenbe, E. & Kretsis, M. (2012). What IS Can Do for Environmental Sustainability: A Report from CAiSE'11 Panel on Green and Sustainable IS. ***Communications of the Association for Information Systems, 30,*** 275-293.

Petty, R. E., Haughtvedt, C. P., & Smith, S. M. (1995). ***Attitude Strength: Antecedents and Consequences.*** Mahwah, NJ: Lawrence Erlbaum Associates.

Pickett-Baker, J., & Ozaki, R. (2008). Pro-Environmental Products: Marketing Influence on Consumer Purchase Decision. ***Journal of Consumer Marketing, 25***(5), 281-93.

Pirsch, J., Gupta, S., & Stacy, L. G. (2007). A framework for understanding corporate social responsibility programs as a continuum: An exploratory study. ***Journal of Business Ethics, 70***(2), 125-140. doi:http://dx.doi.org/10.1007/s10551-006-9100-y

Polites, G. L., & Karahanna, E. (2012). Shackled to the Status Quo: The Inhibiting Effects of Incumbent System Habit, Switching Costs, and Inertia on New System Acceptance. ***Management Information Systems Quarterly, 36***(1), 21-42.

Polonsky, J., & Ottman, J. (1998). Stakeholders' Contribution to the Green New Product Development Process. ***Journal of Marketing Management, 14***(6), 533-557.

Pollution Control Department (2012). ***Environmental Problem from Garbage.*** Retrieved from http://www.pcd.go.th/info_serv/waste_rubbish.htm

Pollution Control Department (2014). ***Department of Water Management Annual Report 2556.*** Retrieved from http://infofile.pcd.go.th/water/Water_Report56.pdf?CFID=3196239&CFTOKEN=61617073

Pomering, A., & Johnson, L. W. (2009). Constructing a corporate social responsibility reputation using corporate image advertising. ***Australasian Marketing Journal, 17***(2), 106-114. Retrieved from http://search.proquest.com/docview/199341768?accountid=32078

Porter, M. E. (1985). ***Competitive Advantage: Creating and Sustaining Superior Performance.*** New York, NY: Free Press.

Porter, M. E. (2004). ***Competitive Strategy: Techniques for Analyzing Industries and Competitors.*** New York, NY: Free Press.

Porter, M. E. & van der Linde, C. (1995). Green and competitive. ***Harvard Business Review, 73***(5), 120–134.

PTIT (2010). ***Plastics Intelligence Update*.** Retrieved from http://plastic.oie.go.th/ReadArticle.aspx?id=3090

Qingfei, M., Shaobo, J., & Gang, Q. (2008). Mobile Commerce User Acceptance Study in China: A Revised UTAUT Model. ***Tsinghua Science and Technology, 13***(3), 257-264.

Quantcast (2010). ***Internet View 2009 Report Quantcast Mobile Web Trends*** [PDF Document], Retrieved from https://www.quantcast.com/wp-content/uploads/2010/11/QC_Mob_2009r11.pdf

Rangsungnoen, G. (2011). ***Factor analysis with SPSS and AMOS in research*.** Bangkok, BKK: SE-ED.

Richardson, J. T. E. (2005). Instruments for obtaining student feedback: a review of the literature. ***Assessment and Evaluation in Higher Education, 30***(4), 387-415.

Roberts, J. A. (1996). Green Consumers in the 1990s: and Implications for Advertising. ***Journal of Business Research, 36,*** 217-231.

Robine, J. M., Cheung, S. L., Le Roy, S., Van Oyen, H., Griffiths, C., Michel, J. P., & Herrmann, F. R. (2008). Death toll exceeded 70,000 in Europe during the summer of 2003. ***Comptes Rendus Biologies, 331***(2), 171-178. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/18241810

Rodríguez, S. (2011, Jun 03). Styrofoam ban could be bad for restaurants. ***McClatchy - Tribune Business News.*** Retrieved from http://search.proquest.com/docview/870206573?accountid=32078

Rodríguez-Rodríguez, D. (2012). Littering in protected areas: A conservation and management challenge - a case study from the autonomous region of Madrid, Spain. ***Journal of Sustainable Tourism, 20***(7), 1011. Retrieved from http://search.proquest.com/docview/1037339992?accountid=32078

Rogers, E. M. (1995). ***Diffusion of Innovations*.** New York, NY: Free Press.

Rogers, E. M. (2003). ***Diffusion of Innovations*** (5th ed.). New York, NY: Free Press.

Rogers, R. W. (1975). A Protection Motivation Theory of Fear Appeals and Attitude Change. ***Journal of Psychology, 91***(1), 93-114. doi:http://dx.doi.org/10.1080/00223980.1975.9915803

Rooney, C. (1993). Economics of Pollution Prevention: How Waste Reduction Pays, ***Pollution Prevention Review, summer,*** 261-276.

Rosenstock, I. (1974). Historical Origins of the Health Belief Model. ***Health Education & Behavior, 2***(4), 328-335.

Rubia, K., Overmeyer, S., Taylor, E., Brammer, M., Williams, S. C., Simmons, A., Andrew, C., & Bullmore, E. T. (2000). Functional frontalisation with age: mapping neurodevelopmental trajectories with fMRI. ***Neuroscience & Biobehavioral Reviews, 24***(1), 13-19.

Sagie, A. (1998). Employee Absenteeism, Organizational Commitment and Job Satisfaction: Another Look. ***Journal of Vocational Behavior, 52***(2), 156-171. doi:10.1006/jvbe.1997.1581

Sarker, S., Valacich, J. S., & Sarker, S. (2005). Technology Adoption by Groups: A Valence Perspective. ***Journal of the Association for Information Systems, 6***(2), 37-71.

Santibánez-Andrade, G., Castillo-Argüero, S., Vega-Pena, E. V., Lindig-Cisneros, R., & Zavala-Hurtado, J. A. (2015). Structural equation modeling as a tool to develop conservation strategies using environmental indicators: The case of the forests of the Magdalena river basin in Mexico City. ***Ecological Indicators, 54,*** 124-136. doi: http://dx.doi.org/10.1016/j.ecolind.2015.02.022

Scharf, E., Fernandes, J., & Kormann, B. (2012). Corporate social responsibility to build strong Brazilian bank brand. ***International Journal of Bank Marketing, 30***(6), 436-451.

Schiffman, L. G., Bednall, D., O'Cass, A., Paladino, A., Ward, S., & Kanuk, L. (2008). ***Consumer Behaviour*** (4th ed.). Australia: Pearson Education.

Schiffman, L. G., Kanuk, L. L., & Wisenblit, J. (2010). ***Consumer Behavior*** (10th ed.). New Jersey, NJ: Pearson Education.

Schmidt, N.-H., Schmidtchen, T., Erek, K., Kolbe, L. M., & Zarnekow, R. (2010). ***Influence of Green It on Consumers' Buying Behavior of Personal Computers: Implications from a Conjoint Analysis*****.** Paper presented at 18th European Conference on Information Systems, Pretoria, South Africa. Retrieved from http://www.uni-

goettingen.de/de/document/download/ad0d516d96abf1b9666de1551712013a-en.pdf/green_it_ecis2010.pdf

Schumacker, R. E., & Lomax, R. G. (2010). ***A Beginner's Guide to Structural Equation Modeling*** (3rd ed.). New York, NY: Routledge.

Seidel, S., Recker, J., & vom Brocke, J. (2013). Sensemaking and Sustainable Practicing: Functional Affordances of Information Systems in Green Transformations. ***MIS Quarterly, 37***(4), 1275-1299.

Sen, S., Bhattacharya, C. B., & Korschun, D. (2006). The role of corporate social responsibility in strengthening multiple stakeholder relationships: A Field experiment. ***Journal of the Academy of Marketing Science, 34***(2), 158-166.

Severin, W. J., & Tankard, J. W., Jr. (2010). ***Communication Theories: Origins, Methods, and Uses in the Mass Media*** (5th ed.). New York, NY: Addison Wesley Longman.

Shahzalal, M. (2013). Initiating Consumer Education is Important for Green Marketing to be flourished: A Preliminary Research. ***International Journal of Marketing and Technology, 3***(7), 70-85. Retrieved from http://search.proquest.com/docview/1459144078?accountid=32078

Shankarmahesh, M. N. (2006). Consumer ethnocentrism: an integrative review of its antecedents and consequences. ***International Marketing Review, 23***(2), 146-172. doi: http://dx.doi.org/10.1108/02651330610660065

Shannon, C. E., & Weaver, W. (1949). ***The Mathematical Theory of Communication.*** Champaign, IL: University of Illinois Press.

Shapira-lishchinsky, O., & Rosenblatt, Z. (2009). Perceptions of organizational ethics as predictors of work absence: A test of alternative absence measures. ***Journal of Business Ethics, 88***(4), 717-734. doi:http://dx.doi.org/10.1007/s10551-008-9977-8

Shewarunotai, W. (2011). *CSR Mission Possible*. Bangkok, BKK: BrandAgeBooks.

Shi, V. G., Koh, S. C. L., Baldwin, J., & Cucchiella, F. (2012). Natural resource based green supply chain management. ***Supply Chain Management: An International Journal, 17***(1), 54-67.

Sinjaru, T. (2014). ***Statistical Research and Data Analysis by SPSS and AMOS*** (15th ed.). Bangkok, BKK: Business R&D.

Skeptics Science. (2015). ***The Escalator.*** Retrieved from http://www.skepticalscience.com /graphics.php?g=47

Smircich, L. (1983). Concepts of Culture and Organizational Analysis. ***Administrative Science Quarterly, 28,*** 339-358.

Soper, D. S. (2016). ***p-Value Calculator for a Chi-Square Test*** [Software]. Available from http://www.danielsoper.com/statcalc

Sowell, E. R., Peterson, B. S., Thompson, P. M., Welcome, S. E., Henkenius, A. L., & Toga, A. W. (2003). Mapping cortical change across the human life span. ***Nature Neuroscience, 6***(3), 309-315.

Sprehn, K. A., Kremer, G., & Riley, D. R. (2013). Propensity for pro-environmental decisions: Decision-making based on values. ***IIE Annual Conference Proceedings,*** 3652-3659. Retrieved from http://search.proquest.com/docview/1471961629?accountid=32078

Sprinkle, G. B., & Maines, L. A. (2010). The benefits and costs of corporate social responsibility. ***Business Horizons, 53***(5), 445-453.

Steel, B. S., Pierce, J. C., Warner, R. L., & Lovrich, N. P. (2015). Environmental value considerations in public attitudes about alternative energy development in Oregon and Washington. ***Environmental Management, 55***(3), 634-645. doi:http://dx.doi.org/10.1007/s00267-014-0419-3

START. (2011).***The Study of Climate Change Impact and Vulnerability and Adaptation of Key Systems and Sectors to Future Climate Variability and Change.*** Bangkok, BKK: Southeast START Regional Center.

Stough-hunter, A., Lekies, K. S., & Donnermeyer, J. F. (2014). When Environmental Action does not Activate Concern: The Case of Impaired Water Quality in Two Rural Watersheds. ***Environmental Management, 54***(6), 1306-19. doi:http://dx.doi.org/10.1007/s00267-014-0370-3

Swathi, B. (2014). Impact of organization culture on employee's job satisfaction: A study of public and private sector. ***Sumedha Journal of Management, 3***(4), 4-

13. Retrieved from http://search.proquest.com/docview/1658370496?accountid=32078

Syed Ali, R. H., Hateem, A. G., & Shah, T. Z. (2012). Analysis of Attitude towards Green Purchase: Pakistan in Context. ***International Journal of Business and Social Science 3***(6). Retrieved from http://search.proquest.com/docview/924461991?accountid=32078

Synthia, I. J., & Kabir, S. (2015). An Investigation of Consumer Attitudes towards New Varieties of Shopping Bags: Exploring EcoAwareness and the Possibility of Behavior Change. ***The Journal of Developing Areas, 49***(5), 183-196. Retrieved from http://search.proquest.com/docview/1707487858?accountid=32078

Szykman, R. L., Bloom, N. P., & Levy, S. A. (1997). A proposed model of the use of package claims and nutrition labels. ***Journal of Public Policy & Marketing, 16***(2), 228–241.

Taghian, M., D'Souza, C., & Polonsky, M. (2015). A stakeholder approach to corporate social responsibility, reputation and business performance. ***Social Responsibility Journal, 11***(2), 340-363.

Taylor, S. & Todd, P. A. (1995a). Assessing IT usage: The role of prior experience. ***MIS Quarterly, 19***(4), 561-570.

Taylor, S. & Todd, P. A. (1995b). Understanding Information Technology Usage: A Test of Competing Models. ***Information Systems Research, 6***(2), 144-176.

Techatassanasoontorn, A. A., & Tanvisuth, A. (2010). IS Use and Quality of Life: A Conceptualization and Empirical Investigation. ***AIS Transactions on Human-Computer Interaction, 2***(2), 26-54.

TEI. (2010). ***Introduction of Green Label Project.*** Retrieved from http://www.tei.or.th/greenlabel/pdf/2010-03-PR-001-R2.pdf

TGO. (2011). ***CFO of local government.*** Bangkok, BKK: P2 Design & Print. Retrieved from http://www.conference.tgo.or.th/download/tgo_main/publication/CF/CF_Guidline_for_localgov_reviseI.pdf

TGO & MTEC. (2012). ***Carbon Foot Print Guideline*** (3rd ed.). Bangkok, BKK: Amarin Printing & Publishing. Retrieved from http://www.tgo.or.th/ download/publication /CFP_Guideline_TH_Edition3.pdf.

Thanh, N. P., Matsui, Y., & Fujiwara, T. (2011). Assessment of plastic waste generation and its potential recycling of household solid waste in Can Tho City, Vietnam**.** ***Environmental Monitoring and Assessment, 175***(1-4), 23-35. doi:http://dx.doi.org/10.1007/s10661-010-1490-8

The Aspen Institute. (2008). ***Where will they lead? 2008 MBA students' attitudes about business and society, Business and Society Program*** [PDF document]. Retrieved May 9, 2014, from http://www.aspeninstitute.org/sites/default/files/content/docs/bsp/SAS_PRINT_FINAL.PDF

The Bangkok Post. (2011, October 18). ***Economic Cost of Flooding.*** Retrieved from http://www.bangkokpost.com/learning/learning-from-news/261955/economic-cost-of-flooding

The World Bank. (2010). ***Climate Risks and Adaptation in Asian Coastal Megacities: A synthesis report.*** Washington, DC: The World Bank.

The World Bank. (2011, December 13th). ***The World Bank Supports Thailand's Post-Floods Recovery Effort.*** Retrieved from http://www.worldbank.org/en/news/feature/2011/12/13/world-bank-supports-thailands-post-floods-recovery-effort

Thompson, R., Higgins, C., & Howell, J. (1991). Personal Computing: Toward a Conceptual Model of Utilization. ***MIS Quarterly, 15***(1), 125-143.

Tierney, P., Hunt, M., & Latkova, P. (2011). Do Travelers Support Green Practices and Sustainable Development. ***Journal of Tourism Insights, 2***(2), 1-16.

Tilchin, O., & Essawi, M. (2013). Knowledge management through organizational culture change. ***International Journal of Business Administration, 4***(5), 24-29. Retrieved from http://search.proquest.com/docview/1490733265?accountid=32078

Tornatzky, L., & Klein, K. (1982). Innovation Characteristics and Innovation Adoption–Implementation: A Meta-analysis of Findings. ***IEEE Transactions on Engineering Management, 29***(1), 28–45.

Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In H. Howe & M. Page (Eds.), ***Nebraska symposium on motivation 1979*** (pp. 195–295). Lincoln, NE: University of Nebraska Press.

Truffer, B., Markard, J., & Wüstenhagen, R. (2001). Eco-Labeling of Electricity—Strategies and Tradeoffs in the Definition of Environmental Standards. ***Energy Policy, 29***(11), 885–897.

Trung, D., & Kumar, S. (2005). Resource Use and Waste Management in Vietnam Hotel Industry. ***Journal of Cleaner Production, 13***(2), 109-116.

Tucker, L., & Melewar, T. C. (2005). Corporate reputation and crisis management: The threat and manageability of anti-corporatism. ***Corporate Reputation Review, 7***(1), 377 – 387.

Turban, E., & Volonino, L. (2012). ***Information Technology for Management*** (8th ed.). New Jersey, NJ: Wiley.

Ullman, J. B. (2001). Structural equation modeling: Reviewing the Basics and Moving Forward. ***Journal of Personality Assessment, 87***(1), 35-50.

UNDESA. (2015a). ***World Population Prospects: The 2015 Revision, Key Findings and Advance Tables.*** Working Paper No. ESA/P/WP.241.

UNDESA. (2015b). ***Global Sustainable Development Report: 2015 Edition Advance Unedited Version.*** United Nations Department of Economic and Social Affairs. Retrieved from https://sustainabledevelopment.un.org/content/documents/1758GSDR 2015 Advance Unedited Version.pdf

van Liere, K. D., & Dunlap, R. E. (1980). The Social Bases of Environmental Concern: A Review of Hypotheses, Explanations, and Empirical Evidence. ***Public Opinion Quarterly, 44,*** 181-197.

van Liere, K. D. (1981). Environmental Concern: Does It Makes a Difference How It's Measured. ***Environment and Behavior, 13***(10), 651-676.

Vandervoort, D. (2000). Social isolation and gender. ***Current Psychology, 19***(3), 229-236. doi:10.1007/s12144-000-1017-5

Vanichbuncha, K. (2011). ***Statistic for Research*** (6th ed.). Bangkok, BKK: Chulalongkorn University Bookshop.

Vanichbuncha, K. (2013). ***การวิเคราะห์สมการโครงสร้าง (SEM) ด้วย AMOS***. Bangkok, BKK: Chulalongkorn University Bookshop.

Velte, T., Velte, A., & Elsenpeter, R. (2008). ***Green IT: Reduce Your Information System's Environmental Impact While Adding to the Bottom Line.*** New York, NY: McGraw-Hill Osborne Media.

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. ***Information Systems Research, 11***(4), 342-365. Retrieved from http://search.proquest.com/docview/208180489?accountid=32078

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. ***Journal of Decision Sciences, 39***(2), 273-315.

Venkatesh, V. & Brown, S. A. (2001). A Longitudinal Investigation of Personal Computer in Homes: Adoption Determinants and Emerging Challenges. ***MIS Quarterly, 25***(1), 71-102.

Venkatesh, V. & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. ***Management Science, 46***(2), 186–204.

Venkatesh, V., & Morris, M. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and user behaviour. ***MIS Quarterly, 24***(1), 115-139.

Venkatesh, V., Morris, M. G., Davis, F. D., & Davis, G. B. (2003). User Acceptance of Information Technology: Toward a Unified View. ***MIS Quarterly, 27,*** 425-478.

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. ***MIS Quarterly, 36***(1), 157-178.

Vidaver-Cohen, D. (2007). Reputation beyond the rankings: A conceptual framework for business school research. ***Corporate Reputation Review, 10***(4), 278-304. doi:http://dx.doi.org/10.1057/palgrave.crr.1550055

Vilke, R. (2011). CSR development problems in Lithuania: Evaluation of promoting and hindering factors. ***Social Responsibility Journal, 7***(4), 604-621. doi:http://dx.doi.org/10.1108/17471111111175164

Virakul, B., Koonmee, K., & McLean, G. N. (2009). CSR activities in award-winning Thai companies. ***Social Responsibility Journal, 5***(2), 178-199.

von Seggern, D. (2007). ***CRC Standard Curves and Surfaces with Mathematics*** (2nd ed.). Boca Raton, FL: Chapman & Hall/CRC.

Völlink, T., Meertens, R., & Midden, C. (2002). Innovating 'Diffusion of Innovation' Theory: Innovation Characteristics and the Intention of Utility Companies to Adopt Energy Conservation Interventions. ***Journal of Environmental Psychology, 22***(4), 333–344. doi:10.1006/jevp.2001.0237

Vykoukal, J., Wolf, M., & Beck, R. (2009). ***Does Green IT Matter? Analysis of the Relationship between Green IT and Grid Technology from a Resource-Based View Perspective.*** Paper presented at 13th Pacific Asia Conference on Information Systems, Hyderabad, India. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1052&context=pacis2009

Wai-ling, T. L. Y. (2004). Combating deceptive advertisements and labeling on food products - an exploratory study on the perceptions of teachers. ***International Journal of Consumer Studies, 28***(2), 117-126. doi:http://dx.doi.org/10.1111/j.1470-6431.2003.00355.x

Walsh, G., & Mitchell, V.-W. (2005). Consumers' vulnerability to perceived product similarity problems: scale development and identification. ***Journal of Macromarketing, 25***(2), 140-52.

Walsh, G., Mitchell, V.-W., Miller, L., & Kilian, T. (2010). Measuring consumer vulnerability to perceived product similarity problems and its consequences. ***Journal of Marketing Management, 26***(1-2), 146-62.

Walsh, G., Shiu, E., & Hassan, L. M. (2012). Investigating the drivers of consumer intention to buy manufacturer brands. ***Journal of Product & Brand Management, 21***(5), 328-340.

Wang, Y.-T., Wu, L.-L., Chen, H.-C., & Yeh, M.-Y. (2012a). ***The Impact of Interactivity on Involvement and Social Presence: The Moderating Effects Of Opinion Leadership.*** Paper presented at Pacific Asia Conference on Information Systems 2012, Ho Chi Minh City, Vietnam. Retrieved from http://aisel.aisnet.org/pacis2012/131.

Wang, Y.-T., Wu, L.-L., Chen, H.-C., & Yeh, M.-Y. (2012b***). Interactivity of Social Media and Online Consumer Behavior: the Moderating Effects of Opinion Leadership.*** Paper presented at 2012 International Conference on Information Systems, Rolando, Florida, USA. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1124&context=icis2012

Waterman, A. S., Schwartz, S. J., & Conti, R. (2008). The Implications of Two Conceptions of Happiness (Hedonic Enjoyment and Eudaimonia) for the Understanding of Intrinsic Motivation. ***Journal of Happiness Studies, 9***(1), 41-79.

Webb, D. J., Mohr, L. A., & Harris, K. E. (2008). A Re-Examination of Socially Responsible Consumption and Its Measurement. ***Journal of Business Research, 61,*** 91–98.

Weigel, F. K., Hazen, B. T., Cegielski, C. G., & Hall, D. J. (2014). Diffusion of Innovations and the Theory of Planned Behavior in Information Systems Research: A Metaanalysis, ***Communications of the Association for Information Systems, 34***(1), 619-636.

WHO. (2015). ***Climate change and health [Fact sheet N°266].*** Retrieved from http://www.who.int/mediacentre/factsheets/fs266/en/

Wilent, s. (2013 September). Rising Seas. ***National Geographic, 146,*** 24-59.

Wills, M. J., El-Gayar, O. F., & Bennett, D. (2008). Examining Healthcare Professionals' Acceptance of Electronic Medical Records Using UTAUT. ***Issues in Information Systems, 9***(2), 396-401.

Wilson, A. (2012, Oct 04). Sunnyvale hosting public input meetings on proposed styrofoam ban. ***McClatchy - Tribune Business News.*** Retrieved from http://search.proquest.com/docview/1082438661?accountid=32078

Wipro ltd. (2012, July). Growth Strategies for 2012 and Beyond. ***Forbes Insights,*** 1-28. Retrieved from http://images.forbes.com/forbesinsights/StudyPDFs/Global_CXO_Outlook.pdf

Wong, V., Turner, W., & Stoneman, P. (1996), Marketing Strategies and Market Prospects for Environmentally-Friendly Consumer Products. ***British Journal of Management, 7***(3), 263-281.

Wu, P. C. S., Yeh, G. Y.-Y., & Hsiao, C.-R. (2011). The effect of store image and service quality on brand image and purchase intention for private label brands. ***Australasian Marketing Journal, 19***(1), 30-39.

Yamane, T. (1967). ***Statistics, an Introductory Analysis*** (2nd Ed.). New York, NY: Harper and Row.

Yamashita, M., & Toyofuku, D. (2012). The validity of the reduction of disposable plastic checkout bags in japan. ***Journal of Environmental Protection, 3***(9), 1020-1024. Retrieved from http://search.proquest.com/docview/1170916634?accountid=32078

Yazdanpanaha, M., Forouzania, M., & Hojjatic, M. (2015). Willingness of Iranian Young Adults to Eat Organic Foods: Application of the Health Belief Model. ***Food Quality and Preference, 41,*** 75-83.

Yew-Jin, L., & Wolff-Michael, R. (2007). The individual|collective dialectic in the learning organization. ***The Learning Organization, 14***(2), 92-107. doi:http://dx.doi.org/10.1108/09696470710726970

Yoonjae, L., & Sangyeon, S. (2012). Pursuit of Happiness by Consumption: Spending Time Vs Spending Money. ***Academy of Marketing Studies Journal, 16***(S), 75-85.

Zaiț, A., & Bertea, P. E. (2011). Methods for Testing Discriminant Validity. ***Management & Marketing, 9***(2), 217-224.

Zauberman, G., & Lynch Jr, J. G. (2005). Resource Slack and Propensity to Discount Delayed Investments of Time versus Money. ***Journal of Experimental Psychology: General, 134***(1), 23-37.

Zhang, Y. (2012). ***IT Enabled Environmentally Friendly Consumption: IT Features Addressing Challenges in Consumer Decision Making*****.** Paper presented at European Conference on Information Systems 2012, Retrieved from http://aisel.aisnet.org/ecis2012/233/

Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means–End Model and Synthesis of Evidence. ***Journal of Marketing, 52***(3), 2-22.

Zhao, H.-h., Gao, Q., Wu, Y.-p., Wang, Y., & Zhu, X.-d. (2013). What affects green consumer behavior in China? A case study from Qingdao**. *Journal of Cleaner Production, 30,*** 1-9. DOI: http://dx.doi.org/10.1016/j.jclepro.2013.05.021

Zhou, S., Quan, X., & Jiang, W. (2012). Corporate social responsibility and sustainable development in China: literature review and case analysis. ***Journal of Supply Chain and Operations Management, 10***(1), 54-65.

Ziegler, A., Busch, T., & Hoffmann, V. H. (2011), Disclosed corporate responses to climate change and stock performance: an international empirical analysis. ***Energy Economics, 33***(6), 1283-1294.

Ziegler, A. D., She, L. H., Tantasarin, C., Jachowski, N. R., & Wasson, R. (2012). Floods, false hope, and the future. ***Hydrological Processes, 26***(11), 1748-1750. DOI: 10.1002/hyp.9260.

Zins, A. (2001). Relative Attitudes and Commitment in Customer Loyalty Models. ***International Journal of Service Industry Management, 12***(3), 269-294.

Zhu, Q., & Sarkis, J. (2015). ***Green Marketing and Consumerism in China: Analyzing the Literature*** (Working Paper WP1-2015). Retrieved from Worcester Polytechnic Institute website: http://www.wpi.edu/Images/CMS/Business/WP1-2015_Green_Marketing.pdf

APPENDICES

APPENDIX A

Sustainability Reports

Collected Sustainability Report

After entering 'sustainability report' in a search engine, this study randomly selected sustainability reports from 83 organizations. All the selected reports were scanned for specific key words as shown in table A.1. If the specific key words are not found within a sustainability report, this study concludes that this environmental policy information is not available in the report. However, when an environmental policy that is not available (n/a) in the report, it **does not mean** that environmental policy does not exist in the organization. The analytical summary of the 83 organizations and their environmental protocols is shown in table A.2.

Table A.1 Searched keywords of organizational environmental policies

Environmental Policy	**Searched Key Word**
Air quality management	CO2, GHG, Carbon
Water usage management	Water, Water consumption, Water management, Efficiency
Reforestation	Reforestation, Forest, Forestry, Tree, Planting, Planted, Plant
Waste management	Waste management, Waste reduce, Waste, Landfill
Recycling	Recycle, Recycling, Reuse
Energy management	Energy management, Energy consumption, Energy efficiency, Energy

Table A.2 Discovered environmental policies in sustainability reports

Organization	**Discovered environmental topic**					
	Air quality management	Water usage management	Reforestation	Waste management	Recycling	Energy management
3M. (2015).	x	x	x	x	x	x
Adidas Group. (2014).	x	x	n/a	x	x	x
Adobe. (2014).	x	x	n/a	x	n/a	x
Airport of Thailand. (2015).	x	x	x	x	n/a	x
Allianz Group. (2014).	x	x	n/a	x	x	x
Apple Inc. (2015).	x	x	x	x	x	x
Autodesk Inc. (2015).	x	x	n/a	x	x	x

Table A.2 Discovered environmental policies in sustainability reports (Cont.)

Organization	Discovered environmental topic					
	Air quality management	Water usage management	Reforestation	Waste management	Recycling	Energy management
Bangchak Petroleum PLC. (2014).	x	x	x	x	x	x
Bank of Ayudhya PCL. (2016).	x	x	x	x	x	x
Bosch, Robert, GmbH. (2014).	x	x	x	x	n/a	x
BP PLC. (2014).	x	x	x	x	x	x
Canon Inc. (2015).	x	x	x	x	x	x
Casio Inc. (2015).	x	x	n/a	n/a	x	x
Caterpillar Inc. (2015).	x	x	x	x	x	x
Chulalongkorn University. (2014).	x	x	x	x	x	x
Coach Inc. (2013).	x	x	n/a	x	x	x
Coca-Cola Company. (2015).	x	x	x	x	x	x
Crocs Inc. (2014).	x	x	n/a	x	x	x
Dell Inc. (2015).	x	x	x	x	x	x
DuPont. (2015).	x	x	x	x	x	x
Electricity Generating Authority of Thailand. (2014).	x	x	x	x	x	x
Electrolux. (2015).	x	x	n/a	x	x	x
Epson Corporation, Seiko. (2015).	x	x	x	x	x	x
Ericsson. (2014).	x	x	n/a	x	x	x
Fédération Internationale de Football Association (FIFA). (2014).	x	x	x	x	x	x
Ford Motor Company. (2015).	x	x	n/a	n/a	x	x
Fujifilm Holdings Corporation. (2015).	x	x	x	x	x	x
Fujitsu Ltd. (2015).	x	x	x	x	x	x
Fuji Xerox Co., Ltd. (2015).	x	x	n/a	x	x	x
General Motors. (2014).	x	x	x	x	x	x
H&M. (2014).	x	x	n/a	x	x	x
Harley-Davidson Motor Company. (2014).	x	x	x	x	x	x
Heineken Holding N.V. (2015).	x	x	x	x	x	x
Hitachi Ltd. (2015).	x	x	x	x	x	x
Honda Motor Co., Ltd. (2015).	x	x	x	x	x	x
Hewlett-Packard Company. (2015).	x	x	x	x	x	x
HSBC Holdings PLC. (2015).	x	x	n/a	x	n/a	x

Table A.2 Discovered environmental policies in sustainability reports (Cont.)

Organization	Discovered environmental topic					
	Air quality management	Water usage management	Reforestation	Waste management	Recycling	Energy management
Huawei Technologies Co. Ltd. (2014).	x	x	n/a	x	x	x
IKEA Group. (2014).	x	x	n/a	x	x	x
ING Group. (2015).	x	x	n/a	x	x	x
Johnson & Johnson. (2014).	x	x	x	x	x	x
Kasikornbank PCL. (2015).	x	x	x	x	x	x
Kimberly-Clark Corporation. (2014).	x	x	x	x	x	x
Krung Thai Bank PCL. (2014).	x	x	n/a	x	x	x
Lenovo Group Ltd. (2015).	x	x	n/a	x	x	x
LG Electronics Inc. (2015).	x	x	x	x	x	x
Logitech International S.A. (2014).	x	x	x	x	x	x
Lufthansa Group. (2015).	x	x	x	x	x	x
Maersk Group. (2015).	x	x	n/a	x	x	x
McDonalds. (2014).	x	x	n/a	x	x	x
Microsoft Corporation. (2015).	x	x	n/a	x	x	x
Mitsubishi Motors Corporation. (2015).	x	x	x	x	x	x
Mitsubishi Electric Corporation. (2015).	x	x	n/a	x	x	x
Nike Inc. (2013).	x	x	n/a	x	x	x
Nissan Motor Corporation. (2015).	x	x	x	x	x	x
Nokia Corporation. (2015).	x	x	n/a	x	x	x
Panasonic Corporation. (2015).	x	x	x	x	x	x
Pepsico Inc. (2014).	x	x	n/a	x	x	x
Philips, Koninklijke, N.V. (2015).	x	x	n/a	x	x	x
Procter & Gamble Co. (2014).	x	x	x	x	x	x
PTT Exploration and Production PCL. (2014).	x	x	x	x	x	x
PTT Global Chemical PCL. (2014).	x	x	x	x	x	x
PTT PCL. (2015).	x	x	x	x	x	x
Puma SE. (2014).	x	x	n/a	x	x	x
Ratchaburi Electricity Generating Holding PCL. (2015).	x	x	x	x	x	x
Reckitt Benckiser Group. (2015).	x	x	n/a	x	x	x
Ricoh Company Ltd. (2015).	x	x	n/a	x	x	x

Table A.2 Discovered environmental policies in sustainability reports (Cont.)

Organization	Discovered environmental topic					
	Air quality management	Water usage management	Reforestation	Waste management	Recycling	Energy management
Samsung. (2015).	x	x	x	x	x	x
Scandinavian Airlines. (2015).	x	x	n/a	x	x	x
S. C. Johnson & Son. (2015).	x	n/a	n/a	x	x	x
Sharp Corporation. (2015).	x	x	x	x	x	x
Shell, Royal Dutch, PLC. (2014).	x	x	x	x	x	x
Siam Cement Public Company. (2015).	x	x	x	x	x	x
Siam Commercial Bank Public Co. Ltd. (2014).	x	x	x	x	x	x
Sony. (2014).	x	x	x	x	x	x
Standard Chartered PLC. (2015).	x	x	n/a	x	x	x
Tetra Pak. (2015).	x	x	x	x	x	x
Thai Beverage Co Ltd. (2014).	x	x	x	x	x	x
Toyota Motor Corporation. (2015).	x	x	x	x	x	x
United Parcel Service of America. (2014).	x	n/a	x	x	x	x
Virgin Atlantic Airways. (2015).	x	x	x	x	x	x
Volkswagen AG. (2014).	x	x	x	x	x	x
Volvo Car Corporation. (2014).	x	x	n/a	x	x	x
Total (83)	**83**	**81**	**50**	**81**	**79**	**83**

Sustainability Report Reference

3M (2015). ***2015 Sustainability Report.*** Retrieved from http://multimedia.3m.com/mws/media/1064170O/3m-2015-sustainability-report.pdf

Adidas Group (2014). ***2014 Sustainability Progress Report - MAKE A DIFFERENCE.*** Retrieved from http://www.adidas-group.com/media/filer_public/e8/32/e832823b-8585-4e26-8990-07b80e3ae71c/2014_sustainability_report_make_a_difference.pdf

Adobe (2014). ***Adobe Corporate Responsibility Report 2014.*** Retrieved from http://wwwimages.adobe.com/content/dam/acom/en/corporate-responsibility/pdfs/adobe-cr-report-2014.pdf

Airport of Thailand (2015). ***Annual Report 2015.*** Retrieved from http://airportthai.co.th/pdf/AOT_AR_PDF-en.pdf

Allianz Group (2014). ***Our sustainability journey, Allianz Group Sustainability Report 2014.*** Retrieved from https://www.allianz.com/media/responsibility/allianz_sustainability_report_2014.pdf

Apple Inc. (2015**). *Environmental Responsibility Report: 2015 Progress Report, Covering FY2014.*** Retrieved from https://www.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2015.pdf

Autodesk Inc. (2015). ***FY2015 sustainability report.*** Retrieved from http://static-dc.autodesk.net/content/dam/autodesk/www/sustainability/docs/pdf/sustainability_report_2015_FINAL.pdf

Bangchak Petroleum PLC. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.bangchak.co.th/(X(1)S(d4iq4j45dracjr45tpw3t545))/Includes/download.aspx?file=../Download/SustainabilityReportDownload_246BCP-SRReport-2014.pdf

Bank of Ayudhya PCL. (2016). ***Sustainability Report 2015.*** Retrieved from https://www.krungsri.com/bank/getmedia/bb96cb18-6dac-452c-9788-accea56b3f63/SD_Report_2015_EN.aspx

Sustainability Report Reference (Cont.)

Bosch, Robert, GmbH. (2014). ***Sustainability Report 2014: Bosch Group.*** Retrieved from http://media.bosch.com/media/ro_master_remote/ publications_documents/Sustainability_Report_2014_EN.pdf

BP PLC. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.bp.com/ content/dam/bp/pdf/sustainability/group-reports/ Sustainability_Report_2014.pdf

Canon Inc. (2015). ***Canon Sustainability Report 2015.*** Retrieved from http://www.canon.com/csr/report/pdf/canon-sus-2015-e.pdf

Casio Inc. (2015). ***CSR Communication Book 2015.*** Retrieved form http://world.casio.com/file/csr/pdf/2015book_casio_all.pdf

Caterpillar Inc. (2015). ***WHAT WE'VE BUILT. WHAT WE'RE SOLVING. 2015 SUSTAINABILITY REPORT.*** Retrieved from http://s7d2.scene7.com/is/ content/Caterpillar/C10875019

Chulalongkorn University (2014). ***Sustainability Report 2013-2014.*** Retrieved from http://www.international-sustainable-campus-network.org/downloads/ reports/chulalongkorn-university/411-chulalongkorn-university-sustainability-report-2013-2014/file

Coach Inc. (2013). ***Sustainability Report: 2012-2013.*** Retrieved from http://www.coach.com/on/demandware.static/Sites-Coach_US-Site/Library-Sites-globalLibrary/default/v1418638080394/legal_document/ Coach_Sustainability_Report_2013.pdf

Coca-Cola Company (2015). ***2014/2015 Sustainability Report.*** Retrieved from http://www.coca-colacompany.com/content/dam/journey/us/en/private /fileassets/pdf/2015/09/2014-2015-sustainability-report.pdf

Crocs Inc. (2014). ***2014 Sustainability Report.*** Retrieved from http://company.crocs.com/wp-content/uploads/2015/03/ CROCS 2014 Sustainability Report_FINAL.pdf

Sustainability Report Reference (Cont.)

Dell Inc. (2015). ***FY15 Corporate Social Responsibility Report.*** Retrieved from http://i.dell.com/sites/doccontent/corporate/corp-comm/en/Documents/fy15-cr-report.pdf

DuPont (2015). ***DUPONT 2015 GLOBAL REPORTING INITIATIVE REPORT.*** Retrieved from http://www.dupont.com/content/dam/dupont/ corporate/our-approach/sustainability/documents/2015-DuPont-GRI-Report.pdf

Electricity Generating Authority of Thailand (2014). ***Sustainability Report 2014.*** Retrieved from http://www.egat.co.th/en/images/sustainable-dev/csr-report/EGAT-CSR-Annual-2014-en.pdf

Electrolux (2015). ***Electrolux Annual Report 2015.*** Retrieved from http://www.electroluxgroup.com/en/wp-content/uploads/sites/2/2016/03/ Electrolux-Annual-Report-2015.pdf

Epson Corporation, Seiko (2015). ***Sustainability Report 2015.*** Retrieved from http://global.epson.com/SR/report/2015/pdf/epson_sr2015_all_e.pdf

Ericsson (2014). ***TECHNOLOGY FOR GOOD: Ericsson Sustainability and Corporate Responsibility Report 2014.*** Retrieved from http://www.ericsson.com/res/thecompany/docs/corporate-responsibility/ 2014-corporate-responsibility-and-sustainability-report.pdf

Fédération Internationale de Football Association (2014). ***Sustainability Report: 2014 FIFA World Cup Brazil.*** Retrieved from http://www.fifa.com/mm/ document/afsocial/general/02/50/92/69/ sustainabilityreportofthe2014fwc_neutral.pdf

Ford Motor Company (2015). ***Global Mobility Through Changing Times Sustainability Report Summary 2014/15.*** Retrieved from http://corporate.ford.com/microsites/ sustainability-report-2014-15/doc/sr14-summary.pdf

Fujifilm Holdings Corporation (2015). ***Sustainability Report 2015 FUJIFILM Holding Corporation.*** Retrieved from http://www.fujifilmholdings.com/en/ sustainability/pdf/2015/ff_sr_2015_en_all.pdf

Sustainability Report Reference (Cont.)

Fujitsu Ltd. (2015). ***Fujitsu Group Environmental Report 2015.*** Retrieved from http://www.fujitsu.com/global/documents/about/resources/reports/sustainability report/2015-environmentalreport/fujitsureport201501-e.pdf

Fuji Xerox Co., Ltd. (2015). ***Sustainability Report 2015: Create…Connect…Into the Future.*** Retrieved from https://www.fujixerox.com/eng/company/sr/ booklet/2015e.pdf

General Motors (2014). ***A DRIVING FORCE: 2014 Sustainability Report.*** Retrieved from http://www.gmsustainability.com/_pdfs/gm2014sr.pdf

H&M (2014). ***H&M Conscious Actions Sustainability Report 2014.*** Retrieved from http://sustainability.hm.com/content/dam/hm/about/documents/en/ CSR/reports/Conscious Actions Sustainability Report 2014_en.pdf

Harley-Davidson Motor Company (2014). ***Sustainability Report 2014.*** Retrieved from http://www.harley-davidson.com/content/dam/h-d/documents/company/ sustainability/en_US/151290_Sustainability Report_3_LO RES1.pdf

Heineken Holding N.V. (2015). ***Heineken N.V. 2014 Sustainability Report.*** Retrieved from http://www.theheinekencompany.com/~/media/Websites/ TheHEINEKENCompany/Downloads/PDF/Sustainability Report 2014/Heineken_SR_080415.ashx

Hitachi Ltd. (2015). ***Hitachi Group Sustainability Report 2015 Highlights.*** Retrieved from http://www.hitachi.com/csr/download/pdf/ csr2015e_highlight.pdf

Honda Motor Co., Ltd. (2015). ***Honda SUSTAINABILITY REPORT 2015.*** Retrieved from http://world.honda.com/sustainability/report/pdf/2015/Honda-SR-2015-en-all.pdf

Hewlett-Packard Company (2015). ***HP 2014 Living Progress Report.*** Retrieved from http://www8.hp.com/h20195/v2/GetDocument.aspx? docname=c04152740

HSBC Holdings PLC. (2015). ***Strategic Report 2015.*** Retrieved from http://www.hsbc.com/~/media/hsbc-com/investorrelationsassets/hsbc-results/2015/annual-results/hsbc-holdings-plc/hsbc-holdings-plc-strategic-report-2015.pdf

Sustainability Report Reference (Cont.)

Huawei Technologies Co. Ltd. (2014). ***Huawei Sustainability Report 2014.*** Retrieved from http://www-file.huawei.com/~/media/CORPORATE/PDF/Sustainability/2014 Huawei sustainability report-final.pdf?la=en

IKEA Group (2014). ***IKEA Group Sustainability Report FY14.*** Retrieved from http://www.ikea.com/ms/en_US/pdf/sustainability_report/sustainability_report_2014.pdf

ING Group (2015). ***ING Group Annual Report 2015: A step ahead.*** Retrieved from http://www.ing.com/web/file?uuid=edb1ce3f-532f-4ddb-a58f-c91c6212d37e&owner=b03bc017-e0db-4b5d-abbf-003b12934429&contentid=36989

Johnson & Johnson (2014). ***2014 Citizenship & Sustainability Report.*** Retrieved from http://www.jnj.com/sites/default/files/pdf/cs/2014-JNJ-Citizenship-Sustainability-Report.pdf

Kasikornbank PCL. (2015). ***Sustainability Development Report 2015.*** Retrieved from http://www.kasikornbank.com/EN/SocialActivities/CSRAnnualReports/CSRAnnualReports/CSR2015.pdf

Kimberly-Clark Corporation. (2014). ***LEADING THE WORLD IN ESSENTIALS FOR A BETTER LIFE - 2014 SUSTAINABILITY REPORT.*** Retrieved from http://www.cms.kimberly-clark.com/UmbracoImages/UmbracoFileMedia/ KC-2014-SustainabilityReport_umbracoFile.pdf

Krung Thai Bank PCL. (2014). ***KTB Social Responsibility Report 2014.*** Retrieved from http://www.ktb.co.th/ktb/Download/CSR/CSRDownload_43KTB_2557_Eng_L_6.pdf

Lenovo Group Ltd. (2015). ***2014/15 Sustainability Report: ALWAYS MOVING FORWARD.*** Retrieved from http://www.lenovo.com/social_responsibility/us/en/FY2015_Lenovo_Sustainability_Report.pdf

LG Electronics Inc. (2015). ***2014-2015 LG Electronics Sustainability Report.*** Retrieved from http://www.lg.com/global/pdf/2014-2015-LGE-Sustainability-Report.pdf

Sustainability Report Reference (Cont.)

Logitech International S.A. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.logitech.com/assets/54091/2/logitech-sustainability-report-2015.pdf

Lufthansa Group (2015). ***Balance: Key data on sustainability within the Lufthansa Group*.** Retrieved from https://www.lufthansagroup.com/ fileadmin/downloads/en/LH-sustainability-report-2015.pdf

Maersk Group (2015). ***Sustainability Report 2014*.** Retrieved from http://www.maersk.com/en/sitecore/media library/the maersk group/sustainability/files/publications/2014/maersk_sustainability_report_2014 _online_version?download=yes

McDonalds (2014). ***The Good Business Report: 2014 McDonald's Sustainability Update*.** Retrieved from http://www.aboutmcdonalds.com/content/dam/ AboutMcDonalds/2.0/pdfs/2014_sustainability_report.pdf

Microsoft Corporation (2015). ***Microsoft 2015 Citizenship Report.*** Retrieved from https://www.microsoft.com/about/csr/DownloadHandler.ashx?Id=02-01-12

Mitsubishi Motors Corporation (2015). ***Integrated Report 2015*.** Retrieved from http://www.mitsubishicorp.com/jp/en/ir/library/ar/pdf/areport/2015/all.pdf

Mitsubishi Electric Corporation (2015). *Environmental Performance Review 2015*. Retrieved from http://www.mitsubishielectric.com/company/ environment/eco_report/ pdf/ecoreport_2015_en.pdf

Nike Inc. (2013). ***Nike FY12-13 Corporate Responsibility Report.*** Retrieved from http://www.nikeresponsibility.com/report/downloads/go/FY12-13_NIKE_Inc_CR_Report.pdf

Nissan Motor Corporation (2015). ***Sustainability Report 2015.*** Retrieved from http://www.nissan-global.com/EN/DOCUMENT/PDF/SR/2015/ SR15_E_All.pdf

Nokia Corporation (2015). ***People & Planet Report 2014: Nokia*.** Retrieved from http://company.nokia.com/sites/default/files/download/people_and_planet_repo rt_2014_0.pdf

Sustainability Report Reference (Cont.)

Panasonic Corporation (2015). ***Sustainability Data Book 2015: Panasonic Corporation.*** Retrieved from http://www.panasonic.com/global/corporate/ sustainability/ downloads/back_number/pdf/2015/sdb2015e.pdf

Pepsico Inc. (2014). ***Performance with Purpose: Sustainability Report 2014.*** Retrieved from http://www.pepsico.com/docs/album/sustainability-reporting/ pep_csr14_sus_overview.pdf

Philips, Koninklijke, N.V. (2015). ***Annual Report 2015:*** *Creating two companies with a bright future*. Retrieved from https://www.annualreport.philips.com/downloads/pdf/ en/PhilipsFullAnnualReport2015_English.pdf

Procter & Gamble Co. (2014). ***P&G 2014 Sustainability Report.*** Retrieved from http://www.pg.com/en_US/downloads/sustainability/reports/PG_2014_Sustainability_Report.pdf

PTT Exploration and Production PCL. (2014). ***2014 Sustainability Report.*** Retrieved from https://www.pttep.com/en/Sustainable Development/ Publications/download.aspx?Content=254

PTT Global Chemical PCL. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.pttgcgroup.com/en/sustainability/report-sd

PTT PCL. (2015). ***Corporate Sustainability Report 2015.*** Retrieved from http://www.pttplc.com/en/Media-Center/Pages/Sustainability-Report.aspx

Puma SE. (2014). ***PUMA RELAY 2014: Annual Report 2014.*** Retrieved from http://report2014.puma-annual-report.com/fileadmin/content_uploads/ Annual Report/2014_GB_ENG_Finale_Fassung_15-04-30.pdf

Ratchaburi Electricity Generating Holding PCL. (2015). ***CREATE Shared Value For Us & All: Sustainability Report 2014.*** Retrieved from http://www.ratch.co.th/en/download/post/1654/attachment

Reckitt Benckiser Group (2015). ***RB Sustainability Report 2014: A global force in health & hygiene.*** Retrieved from https://www.rb.com/ documentdownload.axd?documentresourceid=85452

Sustainability Report Reference (Cont.)

Ricoh Company Ltd. (2015). ***Ricoh Group Sustainability Report 2015.*** Retrieved from https://www.ricoh.com/sustainability/report/download/pdf2015/ all_E.pdf

Samsung (2015). ***Sustainability Report 2015: Global Harmony with People, Society & Environment.*** Retrieved from http://www.samsung.com/us/aboutsamsung/sustainability/sustainabilityreports/download/2015/SAMSUNG_SUSTAINABILITY_REPORT_2015_ENG.pdf

Scandinavian Airlines (2015). ***SAS Sustainability Report 2014/2015.*** Retrieved from http://www.sasgroup.net/en/wp-content/uploads/sites/2/2016/02/SAS-Group-Sustainability-Report-2014_2015-English.pdf

S. C. Johnson & Son (2015). ***Inspired By Family: SC Johnson 2015 Public Sustainability Report.*** Retrieved from http://scjohnson.com/Libraries/Download_Documents/SC_Johnson_2015_Public_Sustainability_Report.sflb.ashx

Sharp Corporation (2015). ***2015 Sustainability Report.*** Retrieved from http://www.sharp-world.com/corporate/eco/report/ssr/pdf/ssr2015e.pdf

Shell, Royal Dutch, PLC. (2014). ***Sustainability Report 2014.*** Retrieved from http://reports.shell.com/sustainability-report/2014/servicepages/downloads/files/download.php?file=entire_shell_sr14.pdf

Siam Cement Public Company (2015). ***Sustainability Report 2015: SCG.*** Retrieved from http://www.scg.co.th/en/04investor_governance/07_annual_report_sustainability_report/tab2/files/2015.zip

Siam Commercial Bank Public Co. Ltd. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.scb.co.th/en/csr/download/main/2

Sony (2014). ***CSR Report 2015.*** Retrieved from http://www.sony.net/SonyInfo/csr_report/issues/CSR2015E_PDF_all_e.pdf

Standard Chartered PLC. (2015). ***Sustainability Summary 2015.*** Retrieved from https://www.sc.com/en/resources/global-en/pdf/annual_reports/annual_report_2015_sustainability_summary.pdf.

Sustainability Report Reference (Cont.)

Tetra Pak (2015). ***SUSTAINABILITY UPDATE 2015.*** Retrieved from http://tpcomprod.blob.core.windows.net/static/documents/sustainability-update-2015.pdf

Thai Beverage Co Ltd. (2014). ***Always with You: Sustainability Report 2014.*** Retrieved from http://www.thaibev.com/images2015/pdf/SRThaiBev2014-Eng.pdf

Toyota Motor Corporation (2015). ***Sustainability Report 2015.*** Retrieved from http://www.toyota-global.com/sustainability/report/sr/pdf/sustainability_report15_fe.pdf

United Parcel Service of America (2014). ***Committed to More: UPS 2014 Corporate Sustainability Report.*** Retrieved from http://sustainability.ups.com/media/UPS-2014-Corporate-Sustainability-Report.pdf

Virgin Atlantic Airways (2015). ***Change is in the air: Sustainability Report 2015.*** Retrieved from http://www.virgin-atlantic.com/content/dam/VAA/Documents/sustainabilitypdf/Virgin_Atlantic_Sustainability_Report_2015_Full.pdf

Volkswagen AG. (2014). ***Sustainability Report 2014.*** Retrieved from http://www.volkswagenag.com/content/vwcorp/info_center/en/publications/2015/04/group-sustainability-report-2014.bin.html/binarystorageitem/file/Volkswagen_Sustainability_Report_2014.pdf

Volvo Car Corporation (2014). ***Volvo car group sustainability report 2014.*** Retrieved from http://assets.volvocars.com/intl/~/media/shared-assets/downloads/sustainability-reports/sustainabilityreport2014.pdf

APPENDIX B

Questionnaire and Test

QUESTIONNAIRE
(Draft version/Pre-IOC Test)

Title: Environmental Awareness in Adoption of Information Technology and Intention to Support Acknowledged Green Businesses: An Empirical Study of Consumers in Thailand

Introduction

My name is Pakvalit Kurkoon and I am a Ph.D. candidate at Rajamangala University of Technology Thanyaburi (RMUTT). This questionnaire was developed as part of my studies of Management of Information Systems. I am researching the buying preferences of Thai consumers and their opinions regarding IT gadgets that are environmentally friendly, their concerns about the environment, and how well Thai consumers understand the significance of eco labels.

I hope you will take part in my survey as I am interested in getting information about the purchase of green consumer technology products (smartphone, tablet, computer, monitor, etc.) by consumers and their perspective regarding the impact of these products on the environment. The results will be used to analyze opinions and patterns of perception. There are just four sections of the questionnaire.

This survey will only take a moment and your input will be greatly appreciated. All responses will be treated confidentially.

Pakvalit Kurkoon
Ph.D. candidate in Business Faculty of
Rajamangala University of Technology Thanyaburi

Section I - Demographic Data

* Please indicate your answer with a check mark × or ✓ in the only appropriate ☐ below.

1. Gender

☐ 1. Male ☐ 2. Female

2. Age

☐ 1. Younger than 20 ☐ 2. 20-30

☐ 3. 31-40 ☐ 4. 41-50

☐ 5. Older than 50

3. Educational background

☐ 1. Lower than high school ☐ 2. High school

☐ 3. Bachelor degree ☐ 4. Master degree

☐ 5. Higher than master degree

4. Average income (Baht)

☐ 1. Less than 20,000 ☐ 2. 20,000 - 30,000

☐ 3. 30,001 - 40,000 ☐ 4. 40,001 – 50,000

☐ 5. More than 50,000

Section II – Green IT Introduction

In your opinion about technology products, such as a smartphone, a notebook computer, a monitor, a printer, etc. that are labeled with an environment-friendly logo, please answer that how the statements below are agreeable.

* Please indicate your answer with a check mark ✗ or ✓ in the appropriate ☐ below.

1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree

Statement	Agreement				
	5	4	3	2	1
You believe that using technology products which have eco-labels can …					
1. Reduces the growth of electronic waste.					
2. Improves efficiency of energy consumption.					
3. Reduces risk of damage to the environment and human health.					
4. Make you feel you are participating in environmental protection.					
Your opinions in regard to technology products that have eco-labels are …					
1. It is worth paying a premium if it protects the environment.					
2. I don't mind reduced performance of an IT product if it will help the environment.					
3. Taking some time to compare energy efficiency among IT products isn't a waste of time.					
You understand the meaning and importance of these symbols (1 = Don't know, 2 = I can guess, 3 = Understand)					

1. 

3	2	1

2. 

3	2	1

3. 

3	2	1

4. 

3	2	1

5. 

3	2	1

6. 

3	2	1

Statement	Agreement				
	5	4	3	2	1
You will look for eco-labels on the packaging of technology products and compare energy efficiency if …					
1. People who are important to you suggest you should.					
2. People who influence your life think you should.					
3. People whose opinions that you value prefer that you do.					

Section III – Green Individual Acceptance

First, what is your opinion regarding the environment and careless behavior toward it? Second, what do you think when some technology companies promote their new products (e.g., a tablet, a smartphone, etc.) and they say such products are friendlier to the environment?

* Please indicate your answer with a check mark × or ✓ in the only appropriate ☐ below.

1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree

Statement	Agreement				
	5	4	3	2	1
Your opinions regarding the environment and people's habits are …					
1. I must reduce the use of plastic bags and foam boxes to reduce negative impact on the environment.					
2. Littering is damaging the eco-system and I must not litter.					
3. Nature is losing its balance and humans are facing more natural disasters because of large amounts of electronic waste and pollution.					
4. I must use electricity and water with efficiency to save natural resources for future generations.					
5. Global warming isn't a myth; humans have to take care of nature to slow the impending environmental crisis.					
In the future, if you have to buy an IT product and you understand (or someone guides you) how to choose an environmentally friendly product, your opinions will be…					
1. I will look for an IT product (e.g., smartphone, tablet) that is eco-friendly (e.g., energy saving).					
2. I will look for green indicators on an IT product label before I purchase.					
3. I will look for international environmental standards or awards on an IT product before I purchase.					

Section VI – Green Organizational

When most people express concern about global warming, pollution, and negative impact on the environment, Should businesses respond to these people by going green? Please choose your agreement level of each statement.

* Please indicate your answer with a check mark ✗ or ✓ in the appropriate ☐ below.

1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree

Statement	Agreement				
	5	4	3	2	1
Your intentions to support environmentally responsible businesses are …					
1. I need to know more about environmental corporate image before I buy products of that business.					
2. Next time I buy some product, I should concern myself with the environmental responsibility (e.g., reforestation activity) of the manufacturer.					
3. Companies that promote their environmental responsibility will have more customers, myself included.					

Does an organization/institute that you participate with have these six environmental policies? (1 = No, 2 = Not sure, 3 = Yes)	3	2	1
1. Reduction of air pollution emission			
2. Water usage efficiency			
3. Reforestation or wildlife restoration			
4. Waste management			
5. Recycle and reuse			
6. Electricity usage efficiency			

Optional Section – Please feel free to give your comments on this questionnaire or share your comments on environmental issues in the space below:

……

……

……

……

……

แบบสอบถาม

(ก่อนการตรวจคุณภาพแบบสอบถาม)

เรื่อง การตระหนักเรื่องสิ่งแวดล้อมในการยอมรับเทคโนโลยีสารสนเทศ และความตั้งใจในการสนับสนุนธุรกิจที่มีภาพลักษณ์ที่เป็นมิตรต่อสิ่งแวดล้อม: การศึกษาเชิงประจักษ์ของผู้บริโภคในประเทศไทย

<u>คำชี้แจง/แนะนำตัว</u>

ผมชื่อ ภัควริศ เกื้อกูล เป็นนักศึกษาจากมหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรีครับ แบบสอบถามฉบับนี้เป็นส่วนหนึ่งของการวิจัยในสาขาบริหารระบบสารสนเทศ ซึ่งจะสอบถามเกี่ยวกับการเลือกซื้อเลือกใช้อุปกรณ์เทคโนโลยี เช่น สมาร์ทโฟน แท็บเล็ท และอุปกรณ์คอมพิวเตอร์ เป็นต้น รวมถึงความเห็นที่เกี่ยวการปัญหาสิ่งแวดล้อมในปัจจุบันและผลกระทบต่อวงการธุรกิจในความคิดของท่าน ขอความกรุณากรอกแบบสอบถามด้วยครับ ใช้เวลาไม่นาน ไม่การกรอกชื่อเพื่อให้ท่านตอบคำถามได้สะดวกสะดวก

ผมมีคาดหวังอย่างยิ่งว่าท่านจะอนุเคราะห์ช่วยกรอกข้อมูลเหล่านี้ การตอบแบบสอบถามจะใช้เวลาไม่นานเกิน 2 - 3 นาที แบบสอบถามนี้แบ่งส่วนออกเป็น 4 ส่วน และขอบพระคุณล่วงหน้าในการอนุเคราะห์จากทุก ๆ ท่าน แบบสอบถามนี้จะเป็นประโยชน์ไม่ใช่เพียงต่อภาครัฐและเอกชนเท่านั้น ทุกความคิดเห็นของท่านจะเป็นส่วนหนึ่งในแนวทางการแก้ปัญหาสิ่งแวดล้อมในสังคมได้อีกด้วย ขอบคุณครับ

นายภัควริศ เกื้อกูล

รหัสประจำตัว 115590505003-6

นักศึกษาปริญญาเอก คณะบริหารธุรกิจ

วิชาเอกระบบสารสนเทศ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี

ส่วนที่ 1 - ข้อมูลทั่วไป

* กรุณากรอกเครื่องหมาย × หรือ ✓ ในช่อง ☐ เพียงช่องเดียวที่ถูกต้องที่สุด

1. เพศ

☐ 1. ชาย ☐ 2. หญิง

2. อายุ

☐ 1. ต่ำกว่า 20 ปี ☐ 2. 20 - 30 ปี

☐ 3. 31 - 40 ปี ☐ 4. 41 - 50 ปี

☐ 5. สูงกว่า 50 ปี

3. การศึกษา

☐ 1. น้อยกว่ามัธยมศึกษาตอนปลาย ☐ 2. มัธยมปลาย / ปวช.

☐ 3. ปริญญาตรี / ปวส. ☐ 4. ปริญญาโท

☐ 5. สูงกว่าปริญญาโท

4. รายได้เฉลี่ยต่อเดือน (บาท)

☐ 1. น้อยกว่า 20,000 ☐ 2. 20,000 - 30,000

☐ 3. 30,001 - 40,000 ☐ 4. 40,001 - 50,000

☐ 5. มากกว่า 50,000

ส่วนที่ 2 - การนำเสนอสินค้าเทคโนโลยีที่เป็นมิตรต่อสิ่งแวดล้อม

ท่านมีความคิดเห็นอย่างไรกับสินค้าเทคโนโลยี เช่น สมาร์ทโฟน คอมพิวเตอร์ โน๊ตบุ๊ค แท็บเล็ต จอภาพ การ์ดแสดงผล เมาส์ เครื่องเล่น DVD และอื่น ๆ ที่มีเครื่องหมายเกี่ยวกับสิ่งแวดล้อม เช่น ตรารีไซเคิล และเครื่องหมายที่สื่อถึงการประหยัดไฟ

*** กรุณากรอกเครื่องหมาย ✗ หรือ ✓ ในช่อง ☐ เพียงช่องเดียวที่ถูกต้องที่สุด**

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	5	4	3	2	1
ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อม ผลที่เกิดคือ ... (PGB)					
1. ช่วยชะลอการเพิ่มของขยะเทคโนโลยีได้ไม่มากก็น้อย					
2. เป็นการสนับสนุนการประหยัดไฟ					
3. ลดการทำร้ายสิ่งแวดล้อมและสุขภาพของคนในสังคม					
4. รู้สึกว่าเป็นส่วนหนึ่งในการช่วยรักษาสิ่งแวดล้อม					
ความเห็นของท่านเกี่ยวกับความคุ้มค่าในความเป็นมิตรต่อสิ่งแวดล้อมของสินค้าเทคโนโลยี คือ ... (RS)					
1. ถ้าการจ่ายเพิ่มหมายถึงการสนับสนุนการรักษาสิ่งแวดล้อม มันก็คุ้ม					
2. ไม่ใช่เรื่องใหญ่ถ้าจะลดประสิทธิภาพที่เกินความจำเป็นออกไปเพื่อลดผลเสียต่อสิ่งแวดล้อม					
3. ไม่ถือว่าเสียเวลาถ้าต้องเปรียบเทียบเรื่องสิ่งแวดล้อมระหว่างสินค้าแต่ละยี่ห้อ เช่น การประหยัดไฟ					
ท่านรู้ความหมายของเครื่องหมายสิ่งแวดล้อมข้างล่างนี้หรือไม่? (1 = ไม่รู้, 2 = พอจะเดาได้, 3 = รู้) (NA)					

1. 

3	2	1

2. 

3	2	1

3. 

3	2	1

4. 

3	2	1

5. 

3	2	1

6. 

3	2	1

ความเห็น	ระดับความเห็น				
	5	4	3	2	1
ท่านจะหันมาใส่ใจเรื่องผลเสียต่อสิ่งแวดล้อมตอนเลือกซื้อสินค้าเทคโนโลยีก็ต่อเมื่อ ... (SI)					
1. คนที่สำคัญและคนที่สนิทของท่านแนะนำ					
2. ผู้ที่มีผลกับชีวิตประจำวันคิดว่าท่านน่าจะทำ					
3. บุคคลที่ท่านนับถือเห็นว่าท่านควรทำ					

ส่วนที่ 3 - มุมมองและการยอมรับสินค้าเทคโนโลยี

มุมมองของท่านที่มีต่อสภาวะแวดล้อม ระบบนิเวศ และพฤติกรรมที่ส่งผลเสียต่อธรรมชาติเป็นอย่างไร และถ้าบริษัทผู้ผลิตสินค้าเทคโนโลยีนำเสนอสินค้าใหม่ที่โฆษณาว่าลดผลเสียต่อสิ่งแวดล้อมและมีการรับรองมาตรฐานสากล ท่านมีความคิดเห็นอย่างไร

*** กรุณากรอกเครื่องหมาย ✕ หรือ ✓ ในช่อง ☐ เพียงช่องเดียวที่ถูกต้องที่สุด**

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	5	4	3	2	1
ในเรื่องสิ่งแวดล้อมและพฤติกรรมในชีวิตประจำวัน ท่านคิดว่า ... (ECH)					
1. ต้องลดการใช้ถุงพลาสติกและกล่องโฟมเท่าที่จะทำได้เพื่อลดผลกระทบต่อสิ่งแวดล้อม					
2. เราไม่ควรการทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน					
3. ธรรมชาติกำลังเสียสมดุลและเรากำลังจะเจอกับภัยธรรมชาติมากขึ้นเพราะมนุษย์เรามีขยะจากการผลิตเทคโนโลยีที่เพิ่มไม่หยุด					
4. เราต้องประหยัดไฟฟ้าและน้ำบ้างเพื่อลดการใช้ทรัพยากรธรรมชาติและรักษาไว้ให้คนรุ่นต่อไป					
5. ภาวะโลกร้อนไม่ใช่เรื่องหลอกเด็ก มนุษย์เราควรใส่ใจดูแลธรรมชาติเพื่อชะลอภัยพิบัติก่อนที่เราจะไม่เหลือโลกให้อยู่					
ในอนาคต ถ้าท่านต้องซื้อสินค้าเทคโนโลยี (เช่น คอมพิวเตอร์ สมาร์ทโฟน ฯลฯ) และมีคนให้ความรู้เรื่องการเลือกซื้ออย่างเป็นมิตรต่อสิ่งแวดล้อมมากขึ้น ท่านจะ ... (GIP)					
1. สนใจเรื่องการประหยัดไฟและผลกระทบต่อสิ่งแวดล้อมให้มากขึ้น					
2. หาความรู้เรื่องมาตรฐานสิ่งแวดล้อม และทำความเข้าใจฉลากก่อนซื้อสินค้าเทคโนโลยีให้มากขึ้น (เช่น ถามพนักงานขาย หรือค้นหาจากในอินเตอร์เน็ต)					
3. สังเกตตรารับรองมาตรฐานและรางวัลสิ่งแวดล้อมจากนานาชาติให้มากขึ้น					

ส่วนที่ 4 - มุมมองต่อการรับผิดชอบเรื่องสิ่งแวดล้อมขององค์กร

ความคิดเห็นของท่านที่มีต่อบริษัทที่โฆษณาความเป็นมิตรต่อสิ่งแวดล้อม และความเป็นมิตรต่อสิ่งแวดล้อมขององค์กรที่ท่านมีความเกี่ยวข้องอยู่ในปัจจุบัน

*** กรุณากรอกเครื่องหมาย ✗ หรือ ✓ ในช่อง ☐ เพียงช่องเดียวที่ถูกต้องที่สุด**

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	5	4	3	2	1
ความตั้งใจของท่านในการสนับสนุนธุรกิจที่มีความรับผิดชอบต่อสิ่งแวดล้อม คือ ... (ISG)					
1. ฉันต้องการข้อมูลเรื่องการรักษาสิ่งแวดล้อมของบริษัทผู้ผลิตสินค้าให้มากขึ้นก่อนที่จะเลือกซื้อสินค้า					
2. หากต้องซื้อสินค้าเทคโนโลยีครั้งต่อไป ฉันควรเลือกยี่ห้อที่แสดงความรับผิดชอบต่อสิ่งแวดล้อมที่แสดงออกอย่างชัดเจน (เช่น สนับสนุนโครงการปลูกป่า)					
3. บริษัทที่โปรโมทผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจนและตรวจสอบได้จะมีลูกค้ามาก รวมถึงตัวฉันเองด้วย					

องค์กรหรือสถาบันที่ท่านทำงานหรือมีความเกี่ยวข้องมีนโยบายหรือการรณรงค์ที่เกี่ยวกับ (PGP) สิ่งแวดล้อมดังต่อไปนี้หรือไม่ (3 = มี, 2 = ไม่แน่ใจ, 1 = ไม่มี)	3	2	1
1. ลดการปล่อยมลพิษทางอากาศ			
2. ประหยัดการใช้น้ำ			
3. การปลูกป่า หรือการปล่อยสัตว์คืนสู่ธรรมชาติ			
4. การลดปริมาณ หรือบริหารจัดการขยะ			
5. รีไซเคิล (นำกลับมาใช้ใหม่)			
6. ประหยัดการใช้ไฟฟ้า			

<u>ส่วนเพิ่มเติม</u> - หากท่านต้องการอธิบายปัญหาสิ่งแวดล้อมในปัจจุบันหรือเสนอแนวทางจัดการปัญหาสิ่งแวดล้อม หรือมีความคิดเห็นเพิ่มเติม โปรดเขียนในพื้นที่ด้านล่างนี้ หากไม่มีกรุณาปล่อยว่างไว้:

.....

.....

.....

.....

.....

.....

.....

แบบทดสอบคุณภาพของแบบสอบถาม

Index of item Objective Congruence (IOC) Test

เรื่อง Environmental Awareness in Adoption of Information Technology and Intention to Support Acknowledged Green Businesses: An Empirical Study of Consumers in Thailand

<u>คำชี้แจง/แนะนำตัว</u>

ผมชื่อ ภัควริศ เกื้อกูล เป็นนักศึกษาจากมหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรีครับ แบบสอบถามฉบับนี้เป็นส่วนหนึ่งของการวิจัยในสาขาบริหารระบบสารสนเทศ ซึ่งจะสอบถามเกี่ยวกับการเลือกซื้อเลือกใช้สินค้าเทคโนโลยี เช่น โทรศัพท์มือถือ แท็บเล็ท และอุปกรณ์คอมพิวเตอร์ เป็นต้น รวมถึงความเห็นที่เกี่ยวการปัญหาสิ่งแวดล้อมและผลกระทบต่อวงการธุรกิจในปัจจุบัน ในฐานะที่ท่านเป็นผู้เชี่ยวชาญในสาขาต่าง ๆ กระผมขอรบกวนเวลาอันมีค่าเพียงไม่นานเพื่อให้คะแนนคุณภาพความชัดเจนของคำถามเหล่านี้ด้วยครับ ขอบคุณครับ

นายภัควริศ เกื้อกูล

รหัสประจำตัว 115590505003-6

นักศึกษาปริญญาเอก คณะบริหารธุรกิจ

วิชาเอกระบบสารสนเทศ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี

คำถาม	คะแนนคุณภาพ		
	-1	0	+1
Construct: Perceived Green Benefit [5-point Likert scale] ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อม ผลที่เกิดคือ ...			
1. ช่วยชะลอการเพิ่มของขยะเทคโนโลยีได้ไม่มากก็น้อย			
2. เป็นการสนับสนุนการประหยัดไฟ			
3. ลดการทำร้ายสิ่งแวดล้อมและสุขภาพของคนในสังคม			
4. รู้สึกว่าเป็นส่วนหนึ่งในการช่วยรักษาสิ่งแวดล้อม			
Construct: Resource Sacrifice [5-point Likert scale] ความเห็นของท่านเกี่ยวกับความคุ้มค่าในความเป็นมิตรต่อสิ่งแวดล้อมของสินค้าเทคโนโลยี คือ ...			
1. การจ่ายเพิ่มหมายถึงการสนับสนุนการรักษาสิ่งแวดล้อม ถือเป็นเรื่องสำคัญ			
2. ไม่ใช่เรื่องใหญ่ถ้าจะลดประสิทธิภาพที่เกินความจำเป็นออกไปเพื่อลดผลเสียต่อสิ่งแวดล้อม			
3. ไม่ถือว่าเสียเวลาถ้าต้องเปรียบเทียบเรื่องสิ่งแวดล้อมระหว่างสินค้าแต่ละยี่ห้อ เช่น การประหยัดไฟ			
Construct: Noticeability [3-point understandability scale] ท่านรู้ความหมายของเครื่องหมายสิ่งแวดล้อมข้างล่างนี้หรือไม่?			

1. 

-1	0	+1

2. 

-1	0	+1

3. 

-1	0	+1

4. 

-1	0	+1

5. 

-1	0	+1

6. 

-1	0	+1

Construct: Social Influence [5-point Likert scale] ท่านจะหันมาใส่ใจเรื่องผลเสียต่อสิ่งแวดล้อมตอนเลือกซื้อสินค้าเทคโนโลยีก็ต่อเมื่อ ...			
1. คนที่สำคัญและคนที่สนิทของท่านแนะนำ			
2. ผู้ที่มีผลกับชีวิตประจำวันคิดว่าท่านน่าจะทำ			
3. บุคคลที่ท่านนับถือเห็นว่าท่านควรทำ			

คำถาม	คะแนนคุณภาพ		
	-1	0	+1
Construct: Environmental Concern & Habit [5-point Likert scale] ในเรื่องสิ่งแวดล้อมและพฤติกรรมในชีวิตประจำวัน ท่านคิดว่า ...			
1. ต้องลดการใช้ถุงพลาสติกและกล่องโฟมเท่าที่จะทำได้เพื่อลดผลกระทบต่อสิ่งแวดล้อม			
2. เราไม่ควรการทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน			
3. ธรรมชาติกำลังเสียสมดุลและเรากำลังจะเจอกับภัยธรรมชาติมากขึ้นเพราะมนุษย์เรามีขยะจากการผลิตเทคโนโลยีที่เพิ่มไม่หยุด			
4. เราต้องประหยัดไฟฟ้าและน้ำบ้างเพื่อลดการใช้ทรัพยากรธรรมชาติและรักษาไว้ให้คนรุ่นต่อไป			
5. ภาวะโลกร้อนไม่ใช่เรื่องหลอกเด็ก มนุษย์เราควรใส่ใจดูแลธรรมชาติเพื่อชะลอภัยพิบัติก่อนที่เราจะไม่เหลือโลกให้อยู่			
Construct: Green Intention in Purchasing/ Using IT Product [5-point Likert scale] ในอนาคต ถ้าท่านต้องซื้อสินค้าเทคโนโลยี (เช่น คอมพิวเตอร์ สมาร์ทโฟน ฯลฯ) และมีคนให้ความรู้เรื่องการเลือกซื้ออย่างเป็นมิตรต่อสิ่งแวดล้อมมากขึ้น ท่านจะ ...			
1. สนใจเรื่องการประหยัดไฟและผลกระทบต่อสิ่งแวดล้อมให้มากขึ้น			
2. หาความรู้เรื่องมาตรฐานสิ่งแวดล้อม และทำความเข้าใจฉลากก่อนซื้อสินค้าเทคโนโลยีให้มากขึ้น (เช่น ถามพนักงานขาย หรือค้นหาจากในอินเตอร์เน็ต)			
3. สังเกตตรารับรองมาตรฐานและรางวัลสิ่งแวดล้อมจากนานาชาติให้มากขึ้น			
Construct: Intention to Support Green-imaged Business [5-point Likert scale] ความตั้งใจของท่านในการสนับสนุนธุรกิจที่มีความรับผิดชอบต่อสิ่งแวดล้อม คือ ...			
1. ฉันต้องการข้อมูลเรื่องการรักษาสิ่งแวดล้อมของบริษัทผู้ผลิตสินค้าให้มากขึ้นก่อนที่จะเลือกซื้อสินค้า			
2. หากต้องซื้อสินค้าเทคโนโลยีครั้งต่อไป ฉันควรเลือกยี่ห้อที่แสดงความรับผิดชอบต่อสิ่งแวดล้อมที่แสดงออกอย่างชัดเจน (เช่น สนับสนุนโครงการปลูกป่า)			
3. บริษัทที่โปรโมทผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจนและตรวจสอบได้จะมีลูกค้ามาก รวมถึงตัวฉันเองด้วย			
Construct: Perceived Green Organizational Policy [3-point perceivability scale] องค์กรหรือสถาบันที่ท่านทำงานหรือมีความเกี่ยวข้องมีนโยบายหรือการรณรงค์ที่เกี่ยวกับสิ่งแวดล้อมดังต่อไปนี้หรือไม่			
1. ลดการปล่อยมลพิษทางอากาศ			
2. ประหยัดการใช้น้ำ			
3. การปลูกป่า หรือการปล่อยสัตว์คืนสู่ธรรมชาติ			
4. การลดปริมาณ หรือบริหารจัดการขยะ			
5. รีไซเคิล (นำกลับมาใช้ใหม่)			
6. ประหยัดการใช้ไฟฟ้า			

Note:

Table A.3 Summary of IOC test

คำถาม	คะแนนคุณภาพ				
	1	2	3	4	Σ
Construct: Perceived Green Benefit [5-point Likert scale] ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อม ผลที่เกิดคือ ...					
1. ช่วยชะลอการเพิ่มของขยะเทคโนโลยีได้ไม่มากก็น้อย	0	1	1	0	0.50
2. เป็นการสนับสนุนการประหยัดไฟ	0	1	1	1	0.75
3. ลดการทำลายสิ่งแวดล้อมและสุขภาพของคนในสังคม	0	1	1	1	0.75
4. ทำให้รู้สึกว่าเป็นส่วนหนึ่งในการช่วยรักษาสิ่งแวดล้อม	0	1	1	1	0.75
Construct: Resource Sacrifice [5-point Likert scale] ความเห็นของท่านเกี่ยวกับความคุ้มค่าของสินค้าเทคโนโลยีในเรื่องความเป็นมิตรต่อสิ่งแวดล้อม คือ ...					
1. การจ่ายเงินเพิ่มเพื่อสนับสนุนการรักษาสิ่งแวดล้อม ถือว่าเป็นเรื่องสำคัญ	1	1	1	1	1.00
2. การลดประสิทธิภาพที่เกินความจำเป็นของสินค้าเพื่อลดผลเสียที่มีต่อสิ่งแวดล้อม เป็นสิ่งที่ยอมรับได้	1	1	1	1	1.00
3. การเปรียบเทียบสินค้าโดยพิจารณาในเรื่องผลกระทบต่อสิ่งแวดล้อม เช่น การประหยัดไฟ เป็นต้น ไม่ถือว่าเสียเวลา	1	0	1	1	0.75
Construct: Noticeability [3-point understandability scale] ท่านรู้ความหมายของเครื่องหมายสิ่งแวดล้อมข้างล่างนี้หรือไม่?					
1. 	1	1	1	1	1.00
2. 	1	1	1	1	1.00
3. 	1	1	1	1	1.00
4. 	1	1	1	1	1.00
5. 	1	1	1	1	1.00
6. 	1	1	1	1	1.00
Construct: Social Influence [5-point Likert scale] ท่านจะหันมาใส่ใจเรื่องผลเสียต่อสิ่งแวดล้อมตอนเลือกซื้อสินค้าเทคโนโลยีก็ต่อเมื่อ ...					
1. คนในครอบครัวและเพื่อนสนิทของท่านแนะนำ	1	1	1	1	1.00
2. เพื่อนร่วมงานและองค์กรที่ท่านทำงานของท่านแนะนำ	1	1	1	1	1.00
3. บุคคลที่มีชื่อเสียงที่ท่านชื่นชอบแนะนำ	1	1	1	1	1.00

คำถาม	คะแนนคุณภาพ				
	1	2	3	4	Σ
Construct: Environmental Concern & Habit [5-point Likert scale] ในเรื่องสิ่งแวดล้อมและพฤติกรรมในชีวิตประจำวัน ท่านคิดว่า ...					
1. ต้องลดการใช้ถุงพลาสติกและกล่องโฟมเท่าที่จะทำได้เพื่อลดผลกระทบต่อสิ่งแวดล้อม	0	1	1	1	0.75
2. ไม่ควรการทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน	0	1	1	1	0.75
3. ธรรมชาติกำลังเสียสมดุล มนุษย์กำลังจะเจอกับภัยธรรมชาติมากขึ้นเพราะมีขยะจากการผลิตเทคโนโลยีที่เพิ่มขึ้นไม่หยุด	0	0	1	1	0.50
4. ต้องประหยัดไฟฟ้าและน้ำบ้างเพื่อลดการใช้ทรัพยากรธรรมชาติและรักษาไว้ให้คนรุ่นต่อไป	0	1	1	1	0.75
5. ภาวะโลกร้อนเป็นเรื่องสำคัญ ควรใส่ใจดูแลธรรมชาติเพื่อชะลอการเกิดภัยพิบัติ	0	1	1	1	0.75
Construct: Green Intention in Purchasing/Using IT Product [5-point Likert scale] ในอนาคต ถ้าท่านต้องซื้อสินค้าเทคโนโลยี (เช่น คอมพิวเตอร์ โทรศัพท์มือถือ ฯลฯ) และมีคนให้ความรู้เรื่องการเลือกซื้ออย่างเป็นมิตรต่อสิ่งแวดล้อมมากขึ้น ท่านจะ ...					
1. สนใจเรื่องการประหยัดไฟและผลกระทบต่อสิ่งแวดล้อมให้มากขึ้น	0	1	1	1	0.75
2. หาความรู้เรื่องมาตรฐานสิ่งแวดล้อม และทำความเข้าใจฉลากก่อนซื้อสินค้าเทคโนโลยีให้มากขึ้น (เช่น ถามพนักงานขาย หรือค้นหาจากในอินเตอร์เน็ต)	0	1	1	1	0.75
3. สนใจเรื่องตรารับรองมาตรฐานและรางวัลสิ่งแวดล้อมจากนานาชาติให้มากขึ้น	0	1	1	1	0.75
Construct: Intention to Support Green-imaged Business [5-point Likert scale] ความตั้งใจของท่านในการสนับสนุนธุรกิจที่มีความรับผิดชอบต่อสิ่งแวดล้อม คือ ...					
1. ต้องการข้อมูลเรื่องการรักษาสิ่งแวดล้อมของบริษัทผู้ผลิตสินค้าให้มากขึ้นก่อนที่จะเลือกซื้อสินค้า	1	1	1	1	1.00
2. หากต้องซื้อสินค้าเทคโนโลยีครั้งต่อไป จะเลือกยี่ห้อที่แสดงความรับผิดชอบต่อสิ่งแวดล้อมที่มีการแสดงออกอย่างชัดเจน (เช่น สนับสนุนโครงการปลูกป่า)	1	1	1	1	1.00
3. สนับสนุนบริษัทที่มีการส่งเสริมผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจนตรวจสอบได้	1	1	1	1	1.00
Construct: Perceived Green Organizational Policy [3-point perceivability scale] องค์กรหรือสถาบันที่ท่านทำงานหรือมีความเกี่ยวข้องมีนโยบายหรือการรณรงค์ที่เกี่ยวกับสิ่งแวดล้อมดังต่อไปนี้หรือไม่					
1. ลดการปล่อยมลพิษทางอากาศ	0	1	1	1	0.75
2. ประหยัดการใช้น้ำ	0	1	1	1	0.75
3. การปลูกป่า หรือการปล่อยสัตว์คืนสู่ธรรมชาติ	0	1	1	1	0.75
4. การลดปริมาณ หรือบริหารจัดการขยะ	0	1	1	1	0.75
5. รีไซเคิล (นำกลับมาใช้ใหม่)	0	1	1	1	0.75
6. ประหยัดการใช้ไฟฟ้า	0	1	1	1	0.75

Note:

Expert 1: ดร. กนกพร ชัยประสิทธิ์

Construct: Perceived Green Benefit [5-point Likert scale]

(ข้อ 3) "ลดการทำร้ายสิ่งแวดล้อมและสุขภาพของคนในสังคม" เปลี่ยนเป็น 'ทำลาย'

Construct: Resource Sacrifice [5-point Likert scale]

(ข้อ 1) "การจ่าย__เพิ่มหมายถึงการสนับสนุนการรักษาสิ่งแวดล้อม ถือเป็นเรื่องสำคัญ" เติม 'เพิ่ม' ในช่องว่าง

Construct: Social Influence [5-point Likert scale]

สามคำถามในหัวข้อนี้มีความหมายคล้ายกันมาก ดูแล้วไม่แตกต่างเลย (แก้ให้ชัดเจนยิ่งขึ้น)

Construct: Intention to Support Green-imaged Business [5-point Likert scale]

(ข้อ 3) "บริษัทที่~~โปรโมท~~ผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจนตรวจสอบได้~~จะมีลูกค้ามาก~~" แก้ไขใหม่

Expert 2: ดร. ชุติมา ภาคสัญไชย

Construct: Environmental Concern & Habit [5-point Likert scale]

(ข้อ 2) "ไม่ควร~~การ~~ทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน"

(ข้อ 3) เพิ่ม 'หรือเกิดจากพฤติกรรมของมนุษย์ เช่น การตัดไม้ทำลายป่า'

Expert 3: ดร.เฉลิมศักดิ์ เลิศวงศ์เสถียร

Construct: Green Intention in Purchasing/ Using IT Product [5-point Likert scale]

คำถามของ Green Intention in Purchasing/ Using IT Product ดูแล้ว ไม่แน่ใจว่าคำถาม ตรงกับ วัตถุประสงค์ของนิยามตัวแปร ไหม -- น่าจะเป็นในการซื้อสินค้า IT มีความสนใจเรื่องผลกระทบต่อสิ่งแวดล้อม มากน้อยแค่ไหม

Expert 4: ดร. จิระวัฒน์ จันทรังษี

Construct: Perceived Green Benefit [5-point Likert scale]

(หัวข้อ) "ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อมผลที่เกิดคือ ..." เปลี่ยนเป็น 'จะ'

(ข้อ 2) "เป็นการสนับสนุนการประหยัดไฟ" เปลี่ยนเป็น 'พลังงานไฟฟ้า'

Construct: Resource Sacrifice [5-point Likert scale]

(ข้อ 3) "การเปรียบเทียบสินค้าโดยพิจารณาในเรื่องผลกระทบต่อสิ่งแวดล้อม เช่น การประหยัดไฟ เป็นต้น ไม่ถือว่าเสียเวลา" เปลี่ยนเป็น 'พลังงานไฟฟ้า' และ 'ถือเป็นเรื่องพึงกระทำ' ตามลำดับ

Construct: Environmental Concern & Habit [5-point Likert scale]

(ข้อ 2) "ไม่ควร~~การ~~ทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน"

Construct: Green Intention in Purchasing/ Using IT Product [5-point Likert scale]

(ข้อ 1) "สนใจเรื่องการประหยัดไฟและผลกระทบต่อสิ่งแวดล้อมให้มากขึ้น" เปลี่ยนเป็น 'พลังงานไฟฟ้า'

Construct: Intention to Support Green-imaged Business [5-point Likert scale]

(ข้อ 3) "สนับสนุนบริษัทที่มีการส่งเสริมผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจน__ตรวจสอบได้" เพิ่ม 'และ' ในช่องว่าง

Expert 4: ดร. ธนัยวงศ์ กีรติวานิชย์

Construct: Perceived Green Benefit [5-point Likert scale]

(หัวข้อ) “ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อมผลที่เกิดคือ ...” เปลี่ยนเป็น ‘ส่งผลให้เกิด’

(ข้อ 1) “ช่วยชะลอการเพิ่มของขยะเทคโนโลยีได้~~ไม่มากก็น้อย~~” เป็นประโยคชี้นำซึ่งไม่ควรมี

Construct: Environmental Concern & Habit [5-point Likert scale]

(ข้อ 2) “ไม่ควร~~การ~~ทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน”

Construct: Green Intention in Purchasing/ Using IT Product [5-point Likert scale]

(ข้อ 2) “หาความรู้เรื่องมาตรฐานสิ่งแวดล้อม และทำความเข้าใจฉลากก่อนซื้อสินค้าเทคโนโลยีให้มากขึ้น (เช่น ถามพนักงาน~~น~~ขาย หรือค้นหาจากในอินเตอร์เน็ต)”

Advisor & Co-advisor

Demographic Data

ปรับรวม “1. น้อยมัธยมศึกษาตอนปลาย” และ “2. มัธยมปลาย / ปวช.” เป็น “1. น้อยกว่าปริญญาตรี / ปวส.”

Construct: Noticeability [3-point understandability scale]

ปรับเรียงคำถามและรูปภาพให้สะดวกต่อการตอบมากขึ้น และตัด “2 = ไม่มั่นใจ” ออกเหลือเพียง “1 = ไม่รู้” และ “2 = รู้”

Construct: Environmental Concern & Habit [5-point Likert scale]

(ข้อ 3) “ธรรมชาติกำลังเสียสมดุล มนุษย์กำลังจะเจอกับภัยธรรมชาติมากขึ้น ...” เปลี่ยนเป็น ‘ประสบ’

ส่วนเพิ่มเติม

ลบ “หากไม่มีกรุณาปล่อยว่างไว้”

แบบสอบถามเรื่องการตระหนักเรื่องสิ่งแวดล้อมในการยอมรับเทคโนโลยีสารสนเทศ และความตั้งใจในการสนับสนุนธุรกิจที่มีภาพลักษณ์ที่เป็นมิตรต่อสิ่งแวดล้อม: การศึกษาเชิงประจักษ์ของผู้บริโภคในประเทศไทย

มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี

<u>คำชี้แจง</u> : แบบสอบถามฉบับนี้เป็นส่วนหนึ่งของการวิจัยในสาขาบริหารระบบสารสนเทศ มหาวิทยาลัยเทคโนโลยีราชมงคลธัญบุรี กรุณากรอกแบบสอบถามทุกข้อตามความเป็นจริง คำตอบแต่ละข้อถือเป็นสิทธิเฉพาะบุคคล และขอรับรองว่าคำตอบของท่านจะถูกเก็บเป็นความลับเพื่อนำมาใช้ในการวิเคราะห์ทางสถิติในลักษณะรวม เพื่อนำข้อมูลที่ได้มาวิเคราะห์ผลและนำไปใช้เพื่อประโยชน์ทางการศึกษาเท่านั้น ขอบพระคุณที่สละเวลาให้ความร่วมมือตอบแบบสอบถามชุดนี้

ส่วนที่ 1 - ข้อมูลทั่วไป

1. เพศ

☐ 1. ชาย ☐ 2. หญิง

2. อายุ

☐ 1. ต่ำกว่า 20 ปี ☐ 2. 20 - 30 ปี

☐ 3. 31 - 40 ปี ☐ 4. 41 - 50 ปี

☐ 5. สูงกว่า 50 ปี

3. การศึกษา

☐ 1. น้อยกว่าปริญญาตรี / ปวส.

☐ 2. ปริญญาตรี / ปวส. ☐ 3. ปริญญาโท

☐ 4. สูงกว่าปริญญาโท

4. รายได้เฉลี่ยต่อเดือน (บาท)

☐ 1. น้อยกว่า 20,000 ☐ 2. 20,000 - 30,000

☐ 3. 30,001 - 40,000 ☐ 4. 40,001 - 50,000

☐ 5. มากกว่า 50,000

ส่วนที่ 2 - การนำเสนอสินค้าเทคโนโลยีที่เป็นมิตรต่อสิ่งแวดล้อม

ท่านมีความคิดเห็นอย่างไรกับสินค้าเทคโนโลยี เช่น สมาร์ทโฟน คอมพิวเตอร์ โน๊ตบุ๊ค แท็บเล็ต จอภาพ การ์ดแสดงผล เมาส์ เครื่องเล่น DVD และอื่น ๆ ที่มีเครื่องหมายเกี่ยวกับสิ่งแวดล้อม เช่น ตรารีไซเคิล และเครื่องหมายที่สื่อถึงการประหยัดไฟ

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	1	2	3	4	5
ท่านเชื่อว่าการใช้สินค้าเทคโนโลยีที่มีเครื่องหมายหรือที่ได้รับรางวัลเกี่ยวกับสิ่งแวดล้อมจะ ... (PGB)					
1. ช่วยชะลอการเพิ่มของขยะเทคโนโลยีได้					
2. เป็นการสนับสนุนการประหยัดพลังงานไฟฟ้า					
3. ลดการทำลายสิ่งแวดล้อมและสุขภาพของคนในสังคม					
4. ทำให้รู้สึกว่าเป็นส่วนหนึ่งในการช่วยรักษาสิ่งแวดล้อม					
ความเห็นของท่านเกี่ยวกับความคุ้มค่าในความเป็นมิตรต่อสิ่งแวดล้อมของสินค้าเทคโนโลยี คือ ... (RS)					
1. การจ่ายเงินเพิ่มเพื่อสนับสนุนการรักษาสิ่งแวดล้อม ถือว่าเป็นเรื่องสำคัญ					
2. การลดประสิทธิภาพที่เกินความจำเป็นของสินค้าเพื่อลดผลเสียที่มีต่อสิ่งแวดล้อม เป็นสิ่งที่ยอมรับได้					
3. การเปรียบเทียบสินค้าโดยพิจารณาในเรื่องผลกระทบต่อสิ่งแวดล้อม เช่น การประหยัดพลังงานไฟฟ้า เป็นต้น ถือเป็นเรื่องพึงกระทำ					
ท่านรู้ความหมายของเครื่องหมายสิ่งแวดล้อมข้างล่างนี้หรือไม่? (NA)					
1.  ☐ 1. ไม่รู้ ☐ 2. รู้	2.  ☐ 1. ไม่รู้ ☐ 2. รู้	3.  ☐ 1. ไม่รู้ ☐ 2. รู้			
4.  ☐ 1. ไม่รู้ ☐ 2. รู้	5.  ☐ 1. ไม่รู้ ☐ 2. รู้	6.  ☐ 1. ไม่รู้ ☐ 2. รู้			
ท่านจะหันมาใส่ใจเรื่องผลเสียต่อสิ่งแวดล้อมตอนเลือกซื้อสินค้าเทคโนโลยีก็ต่อเมื่อ ... (SI)					
1. คนในครอบครัวและเพื่อนสนิทของท่านแนะนำ					
2. เพื่อนร่วมงานและองค์กรที่ท่านทำงานของท่านแนะนำ					
3. บุคคลที่มีชื่อเสียงที่ท่านชื่นชอบแนะนำ					

ส่วนที่ 3 - มุมมองและการยอมรับสินค้าเทคโนโลยี

มุมมองของท่านที่มีต่อสภาวะแวดล้อม ระบบนิเวศ และพฤติกรรมที่ส่งผลเสียต่อธรรมชาติเป็นอย่างไร และถ้าบริษัทผู้ผลิตสินค้าเทคโนโลยีนำเสนอสินค้าใหม่ที่โฆษณาว่าลดผลเสียต่อสิ่งแวดล้อมและมีการรับรองมาตรฐานสากล ท่านมีความคิดเห็นอย่างไร

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	1	2	3	4	5
ในเรื่องสิ่งแวดล้อมและพฤติกรรมในชีวิตประจำวัน ท่านคิดว่า ... (ECH)					
1. ต้องลดการใช้ถุงพลาสติกและกล่องโฟมเท่าที่จะทำได้เพื่อลดผลกระทบต่อสิ่งแวดล้อม					
2. ไม่ควรทิ้งขยะไม่เป็นที่เป็นทาง เพราะมีผลเสียต่อสิ่งแวดล้อมและชุมชน					
3. ธรรมชาติกำลังเสียสมดุล มนุษย์กำลังจะเจอกับภัยธรรมชาติมากขึ้นเพราะมีขยะจากการผลิตเทคโนโลยีที่เพิ่มขึ้นไม่หยุด และจากพฤติกรรมของมนุษย์ เช่น การตัดไม้ทำลายป่า					
4. ต้องประหยัดไฟฟ้าและน้ำเพื่อลดการใช้ทรัพยากรธรรมชาติและรักษาไว้ให้คนรุ่นต่อไป					
5. ภาวะโลกร้อนเป็นเรื่องสำคัญ ควรใส่ใจดูแลธรรมชาติเพื่อชะลอการเกิดภัยพิบัติ					
ในอนาคต ถ้าท่านต้องซื้อสินค้าเทคโนโลยี (เช่น คอมพิวเตอร์ โทรศัพท์มือถือ ฯลฯ) ท่านจะ ... (GIP)					
1. สนใจเรื่องการประหยัดพลังงานไฟฟ้า รวมทั้งผลกระทบต่อสิ่งแวดล้อมให้มากขึ้น					
2. หาความรู้เรื่องมาตรฐานสิ่งแวดล้อม รวมทั้งทำความเข้าใจฉลากก่อนซื้อสินค้าเทคโนโลยีให้มากขึ้น (เช่น ถามพนักงานขาย หรือค้นหาจากในอินเตอร์เน็ต)					
3. สนใจเรื่องการรับรองมาตรฐาน (เช่น ตรารับรอง หรือรางวัลสิ่งแวดล้อมจากนานาชาติ) ให้มากขึ้น					

ส่วนที่ 4 - มุมมองต่อการรับผิดชอบเรื่องสิ่งแวดล้อมขององค์กร

ความคิดเห็นของท่านที่มีต่อบริษัทที่โฆษณาความเป็นมิตรต่อสิ่งแวดล้อม และความเป็นมิตรต่อสิ่งแวดล้อมขององค์กรที่ท่านมีความเกี่ยวข้องอยู่ในปัจจุบัน

1 = ไม่เห็นด้วยอย่างยิ่ง, 2 = ไม่เห็นด้วย, 3 = ตัดสินใจไม่ได้, 4 = เห็นด้วย, 5 = เห็นด้วยอย่างยิ่ง

ความเห็น	ระดับความเห็น				
	1	2	3	4	5
ความตั้งใจของท่านในการสนับสนุนธุรกิจที่มีความรับผิดชอบต่อสิ่งแวดล้อม คือ ... (ISG)					
1. ต้องการข้อมูลเรื่องการรักษาสิ่งแวดล้อมของบริษัทผู้ผลิตสินค้าให้มากขึ้นก่อนที่จะเลือกซื้อสินค้าหรือใช้บริการ					
2. หากต้องซื้อสินค้าเทคโนโลยีครั้งต่อไป ควรเลือกยี่ห้อที่แสดงความรับผิดชอบต่อสิ่งแวดล้อม (เช่น การลดมลพิษ) และมีการแสดงออกอย่างชัดเจน					
3. สนับสนุนบริษัทที่มีการส่งเสริมผลงานการช่วยเหลือสิ่งแวดล้อมอย่างชัดเจน (เช่น สนับสนุนโครงการปลูกป่า) และตรวจสอบได้					

องค์กรหรือสถาบันที่ท่านทำงาน (หรือมีความเกี่ยวข้อง) มีนโยบายหรือการรณรงค์ที่เกี่ยวกับ (PGP) สิ่งแวดล้อมดังต่อไปนี้หรือไม่ (3 = มี, 2 = ไม่แน่ใจ, 1 = ไม่มี)	1	2	3
1. ลดการปล่อยมลพิษทางอากาศ			
2. ประหยัดการใช้น้ำ			
3. การปลูกป่า หรือการปล่อยสัตว์คืนสู่ธรรมชาติ			
4. การลดปริมาณ หรือบริหารจัดการขยะ			
5. รีไซเคิล (นำกลับมาใช้ใหม่)			
6. ประหยัดการใช้ไฟฟ้า			

ส่วนเพิ่มเติม - หากท่านต้องการอธิบายปัญหาสิ่งแวดล้อมในปัจจุบันหรือเสนอแนวทางจัดการปัญหาสิ่งแวดล้อม หรือมีความคิดเห็นเพิ่มเติม โปรดเขียนในพื้นที่ด้านล่างนี้:

.....

.....

.....

.....

.....

.....

.....

APPENDIX C

Data and Analysis

Pilot Test

Reliability Statistics - Perceived Green Benefit

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.910	.917	4

Reliability Statistics - Resource Sacrifice

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.833	.855	3

Warnings: Each of the following component variables has zero variance and is removed from the scale: Noticeability_Label5

Reliability Statistics - Noticeability

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.503	.514	5

Reliability Statistics - Social Influence

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.883	.883	3

Reliability Statistics – Environmental Concern & Habit

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.948	.951	5

Reliability Statistics - Green Intention in Purchasing or Using IT Product

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.930	.930	3

Reliability Statistics - Intention to Supporting Green Imaged Business

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.924	.925	3

Reliability Statistics - Perceived Green Organizational Policy

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.772	.740	6

Reliability Statistics - Overall

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.970	.966	32

Reliability Statistics - w/o NA and PGP

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.978	.980	21

Demographic Data

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	298	48.2	48.2	48.2
	Female	320	51.8	51.8	100.0
	Total	618	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 20	61	9.9	9.9	9.9
	20-30	266	43.0	43.0	52.9
	31-40	147	23.8	23.8	76.7
	41-50	95	15.4	15.4	92.1
	Over 50	49	7.9	7.9	100.0
	Total	618	100.0	100.0	

Educational Background

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under bachelor's degree/ high vocational certificate	137	22.2	22.2	22.2
	Bachelor's degree/ high vocational certificate	355	57.4	57.4	79.6
	Master's degree	112	18.1	18.1	97.7
	Above master's degree	14	2.3	2.3	100.0
	Total	618	100.0	100.0	

Income (Salary)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 20,000THB	283	45.8	45.8	45.8
	20,000-30,000THB	149	24.1	24.1	69.9
	30,001-40,000THB	81	13.1	13.1	83.0
	40,001-50,000THB	52	8.4	8.4	91.4
	Higher than 50,000THB	53	8.6	8.6	100.0
	Total	618	100.0	100.0	

Descriptive Statistics

Average - Perceived Green Benefit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	3	.5	.5	.5
	2.00000	35	5.7	5.7	6.1
	3.00000	77	12.5	12.5	18.6
	4.00000	278	45.0	45.0	63.6
	5.00000	225	36.4	36.4	100.0
	Total	618	100.0	100.0	

Average - Resource Sacrifice

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	9	1.5	1.5	1.5
	2.00000	31	5.0	5.0	6.5
	3.00000	132	21.4	21.4	27.8
	4.00000	301	48.7	48.7	76.5
	5.00000	145	23.5	23.5	100.0
	Total	618	100.0	100.0	

Average - Noticeability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	175	28.3	28.3	28.3
	2.00000	443	71.7	71.7	100.0
	Total	618	100.0	100.0	

Average – Noticeability (Converted to 5)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3.00000	175	28.3	28.3	28.3
	4.00000	308	49.8	49.8	78.2
	5.00000	135	21.8	21.8	100.0
	Total	618	100.0	100.0	

Average - Social Influence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	41	6.6	6.6	6.6
	2.00000	72	11.7	11.7	18.3
	3.00000	195	31.6	31.6	49.8
	4.00000	239	38.7	38.7	88.5
	5.00000	71	11.5	11.5	100.0
	Total	618	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Average - Perceived Green Benefit	618	1.00000	5.00000	4.1116505	.86466388
Average - Resource Sacrifice	618	1.00000	5.00000	3.8770227	.87524363
Average - Noticability (Converted)	618	3.00000	5.00000	3.9352751	.70585764
Average - Noticability	618	1.00	2.00	1.7168	.45090
Average - Social Influence	618	1.00000	5.00000	3.3673139	1.04642615
Valid N (listwise)	618				

Average - Environmental Concern & Habit

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	2	.3	.3	.3
	2.00000	12	1.9	1.9	2.3
	3.00000	36	5.8	5.8	8.1
	4.00000	173	28.0	28.0	36.1
	5.00000	395	63.9	63.9	100.0
	Total	618	100.0	100.0	

Average - Green Intention in Purchasing or Using IT Product

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	9	1.5	1.5	1.5
	2.00000	16	2.6	2.6	4.0
	3.00000	57	9.2	9.2	13.3
	4.00000	253	40.9	40.9	54.2
	5.00000	283	45.8	45.8	100.0
	Total	618	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Average - Environmental Concern & Habit	618	1.00000	5.00000	4.5323625	.72224747
Average - Green Intention in Purchasing or Using IT	618	1.00000	5.00000	4.2702265	.84434641
Product					
Valid N (listwise)	618				

Average - Intention to Supporting Green Imaged Business

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00000	9	1.5	1.5	1.5
	2.00000	16	2.6	2.6	4.0
	3.00000	61	9.9	9.9	13.9
	4.00000	290	46.9	46.9	60.8
	5.00000	242	39.2	39.2	100.0
	Total	618	100.0	100.0	

Average - Perceived Green Organizational Policy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00000	33	5.3	5.3	5.3
	3.00000	109	17.6	17.6	23.0
	4.00000	288	46.6	46.6	69.6
	5.00000	188	30.4	30.4	100.0
	Total	618	100.0	100.0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Average - Intention to Supporting Green Imaged Business	618	1.00000	5.00000	4.1974110	.82889067
Average - Perceived Green Organizational Policy	618	2.00000	5.00000	4.0210356	.83358060
Valid N (listwise)	618				

Multicollinearity Diagnosis

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Average - Perceived Green Benefit	.487	2.053
	Average - Resource Sacrifice	.578	1.730
	Average - Noticability	.920	1.086
	Average - Social Influence	.762	1.312
	Average - Environmental Concern & Habit	.647	1.545
	Average - Perceived Green Organizational Policy	.835	1.197

a. Dependent Variable: Average - Green Intention in Purchasing or Using IT Product

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	PGB	RS	NA	SI	ECH	PGP
1	1	6.824	1.000	.00	.00	.00	.00	.00	.00	.00
	2	.063	10.443	.02	.00	.00	.04	.83	.01	.02
	3	.041	12.931	.01	.07	.29	.09	.11	.01	.17
	4	.029	15.338	.01	.03	.00	.38	.03	.00	.64
	5	.017	19.783	.09	.03	.47	.20	.00	.36	.13
	6	.016	20.552	.10	.78	.23	.15	.03	.05	.01
	7	.010	25.967	.77	.09	.00	.15	.00	.58	.04

a. Dependent Variable: Average - Green Intention in Purchasing or Using IT Product

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Average - Green Intention in Purchasing or Using IT Product	.873	1.145
	Average - Perceived Green Organizational Policy	.873	1.145

a. Dependent Variable: Average - Intention to Supporting Green Imaged Business

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	GIP	PGP
1	1	2.957	1.000	.00	.00	.00
	2	.026	10.764	.01	.53	.81
	3	.018	12.855	.98	.46	.19

a. Dependent Variable: Average - Intention to Supporting Green Imaged Business

Correlation Matrix

	PGB_1	PGB_2	PGB_3	PGB_4	RS_1	RS_2	RS_3	SI_1	SI_2	SI_3	ECH_1	ECH_2	ECH_3	ECH_4	ECH_5	GIP_1	GIP_2	GIP_3	ISG_1	ISG_2	ISG_3
PGB_1	1																				
PGB_2	.491	1																			
PGB_3	.621	.556	1																		
PGB_4	.543	.610	.683	1																	
RS_1	.471	.366	.466	.455	1																
RS_2	.448	.403	.458	.467	.542	1															
RS_3	.349	.440	.422	.516	.424	.424	1														
SI_1	.293	.348	.336	.343	.188	.303	.246	1													
SI_2	.393	.358	.406	.365	.285	.354	.247	.759	1												
SI_3	.366	.235	.308	.258	.267	.289	.089	.507	.616	1											
ECH_1	.376	.359	.375	.346	.376	.334	.331	.207	.264	.204	1										
ECH_2	.423	.354	.410	.407	.400	.354	.308	.180	.255	.232	.656	1									
ECH_3	.440	.361	.422	.446	.357	.330	.365	.226	.299	.265	.567	.661	1								
ECH_4	.442	.368	.426	.389	.413	.354	.394	.214	.265	.244	.578	.586	.603	1							
ECH_5	.472	.411	.425	.438	.389	.330	.358	.184	.282	.243	.571	.681	.678	.667	1						
GIP_1	.434	.461	.405	.452	.364	.347	.395	.308	.325	.225	.455	.489	.516	.585	.538	1					
GIP_2	.526	.414	.524	.468	.439	.414	.375	.256	.353	.298	.561	.567	.559	.642	.577	.625	1				
GIP_3	.552	.451	.555	.511	.475	.434	.443	.296	.360	.328	.514	.582	.619	.599	.617	.611	.698	1			
ISG_1	.561	.391	.518	.486	.466	.396	.343	.306	.357	.347	.448	.475	.516	.527	.542	.514	.672	.695	1		
ISG_2	.520	.494	.528	.551	.438	.411	.459	.345	.389	.290	.496	.518	.533	.577	.552	.608	.643	.674	.621	1	
ISG_3	.463	.456	.528	.550	.412	.457	.447	.342	.364	.275	.419	.435	.500	.500	.516	.598	.625	.644	.592	.712	1

Note: Please note that Noticeability (NA) and Perceived Green Organizational Policy (PGP) are not use 5-point scale as the others, and have been converted to single-indicator variables for specify purpose. Thus, they should be ignored in this Factor Analysis.

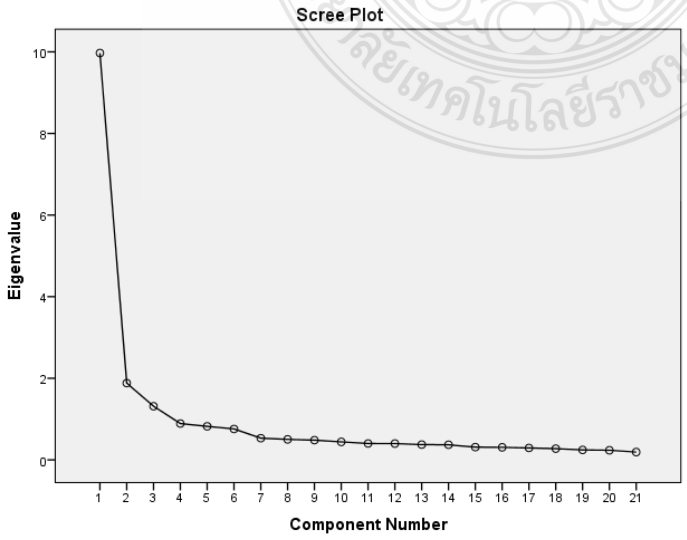
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.948
Bartlett's Test of Sphericity	Approx.Chi-Square	8180.104
	df	210
	Sig.	.000

Communalities

	Initial	Extraction
PGB_1	1.000	.727
PGB_2	1.000	.721
PGB_3	1.000	.761
PGB_4	1.000	.766
RS_1	1.000	.771
RS_2	1.000	.730
RS_3	1.000	.748
SI_1	1.000	.843
SI_2	1.000	.847
SI_3	1.000	.754
ECH_1	1.000	.691
ECH_2	1.000	.776
ECH_3	1.000	.699
ECH_4	1.000	.678
ECH_5	1.000	.734
GIP_1	1.000	.681
GIP_2	1.000	.741
GIP_3	1.000	.747
ISG_1	1.000	.743
ISG_2	1.000	.734
ISG_3	1.000	.746

Extraction Method: Principal Component Analysis.



Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	9.971	47.480	47.480	9.971	47.480	47.480	7.966
2	1.882	8.963	56.443	1.882	8.963	56.443	3.785
3	1.315	6.263	62.706	1.315	6.263	62.706	6.289
4	.889	4.236	66.941	.889	4.236	66.941	4.760
5	.822	3.916	70.857	.822	3.916	70.857	6.850
6	.758	3.611	74.468	.758	3.611	74.468	.895
7	.532	2.535	77.003				
8	.502	2.391	79.394				
9	.483	2.299	81.693				
10	.441	2.100	83.793				
11	.401	1.912	85.704				
12	.399	1.902	87.607				
13	.374	1.781	89.387				
14	.370	1.761	91.149				
15	.312	1.486	92.635				
16	.308	1.465	94.100				
17	.292	1.390	95.490				
18	.276	1.312	96.802				
19	.243	1.159	97.961				
20	.236	1.125	99.086				
21	.192	.914	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Component Matrix[a]

	Component					
	1	2	3	4	5	6
GIP_3	.826					
ISG_2	.802					
GIP_2	.798					
ISG_3	.764					
ISG_1	.761				-.397	
ECH_5	.744	-.325				
ECH_4	.736	-.306				
ECH_3	.726					
GIP_1	.725			-.329		
PGB_3	.723					-.331
PGB_4	.716		-.390			
PGB_1	.710					-.324
ECH_2	.706	-.341				
ECH_1	.665	-.301				
PGB_2	.644		-.318			
RS_1	.623			.487		
RS_2	.605			.370		.324
RS_3	.579		-.428		.341	.318
SI_1	.465	.674				
SI_2	.544	.652	.326			
SI_3	.449	.547	.418			

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

Pattern Matrix[a] (Direct Oblimin, Delta: 0)

	Component					
	1	2	3	4	5	6
ISG_3	.822					
ISG_2	.712					
ISG_1	.710					
GIP_1	.707					
GIP_2	.682					
GIP_3	.630					
SI_1		.887				
SI_2		.872				
SI_3		.738				-.349
PGB_2			-.795			
PGB_4			-.773			
PGB_3			-.761			
PGB_1			-.583			-.362
RS_1				.821		
RS_2				.788		
ECH_2					.881	
ECH_1					.833	
ECH_3					.731	
ECH_5					.727	
ECH_4	.351				.570	
RS_3				.397		.575

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 19 iterations.

Structure Matrix (Direct Oblimin, Delta: 0)

	Component					
	1	2	3	4	5	6
ISG_3	.843	.340	-.553	.442	.473	
ISG_2	.841	.352	-.580	.427	.572	
GIP_3	.834	.317	-.552	.493	.659	
GIP_2	.833		-.485	.457	.659	
ISG_1	.802	.326	-.512	.486	.532	
GIP_1	.791	.302	-.457	.301	.583	
SI_2	.374	.914	-.408	.317		
SI_1	.333	.892	-.369			
SI_3		.779		.347		-.383
PGB_4	.552	.324	-.865	.487	.418	
PGB_3	.558	.349	-.846	.511	.425	
PGB_2	.466	.343	-.822	.338	.408	
PGB_1	.564	.345	-.730	.530	.465	-.312
RS_1	.457		-.453	.870	.426	
RS_2	.427	.346	-.472	.836	.353	
ECH_2	.533		-.414	.387	.877	
ECH_5	.634		-.470	.346	.841	
ECH_3	.607		-.449	.330	.824	
ECH_1	.502		-.356	.382	.823	
ECH_4	.690		-.388	.404	.777	
RS_3	.477		-.542	.551	.375	.583

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Pattern Matrix[a] (Promax, Kappa: 4)

	Component					
	1	2	3	4	5	6
ECH_2	.926					
ECH_1	.878					
ECH_3	.762					
ECH_5	.755					
ECH_4	.585	.368				
ISG_3		.913				
ISG_1		.795				
ISG_2		.784				
GIP_1		.781				
GIP_2		.756				
GIP_3		.692				
PGB_2			.856			
PGB_3			.830			
PGB_4			.827			
PGB_1			.642			
SI_1				.911		
SI_2				.889		
SI_3				.743		-.347
RS_1					.903	
RS_2					.857	.330
RS_3					.384	.706

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Structure Matrix (Promax, Kappa: 4)

	Component					
	1	2	3	4	5	6
ECH_2	.876	.573	.473		.437	
ECH_5	.847	.663	.522		.398	
ECH_3	.829	.636	.498		.377	
ECH_1	.822	.535	.403		.400	
ECH_4	.787	.705	.441		.430	
GIP_3	.687	.852	.615	.349	.546	
GIP_2	.685	.846	.554	.319	.518	
ISG_2	.603	.843	.613	.389	.439	
ISG_3	.508	.837	.579	.378	.438	
ISG_1	.566	.826	.595	.348	.578	
GIP_1	.605	.778	.476	.338		
PGB_3	.462	.611	.869	.380	.558	
PGB_4	.452	.591	.852	.365	.473	
PGB_1	.499	.626	.792	.366	.627	
PGB_2	.435	.498	.789	.382	.312	.322
SI_2	.313	.422	.452	.918	.353	
SI_1		.362	.381	.899		
SI_3		.359	.358	.767	.461	-.355
RS_1	.453	.515	.520		.860	
RS_2	.381	.478	.513	.376	.785	
RS_3	.395	.480	.497		.407	.648

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Component Correlation Matrix (Direct Oblimin, Delta: 0)

Component	1	2	3	4	5	6
1	1.000	.329	-.564	.453	.632	.027
2	.329	1.000	-.353	.275	.230	-.032
3	-.564	-.353	1.000	-.484	-.433	-.092
4	.453	.275	-.484	1.000	.392	-.038
5	.632	.230	-.433	.392	1.000	-.013
6	.027	-.032	-.092	-.038	-.013	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Correlation Matrix (Promax, Kappa: 4)

Component	1	2	3	4	5	6
1	1.000	.704	.534	.289	.473	.037
2	.704	1.000	.676	.416	.566	.055
3	.534	.676	1.000	.440	.591	.058
4	.289	.416	.440	1.000	.342	.034
5	.473	.566	.591	.342	1.000	-.190
6	.037	.055	.058	.034	-.190	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Rotated Component Matrix[a] (Varimax)

	Component					
	1	2	3	4	5	6
ECH_2	.821					
ECH_1	.771					
ECH_5	.744	.337				
ECH_3	.734	.308				
ECH_4	.651	.449				
ISG_3		.729				
ISG_1		.681				
ISG_2	.326	.679				
GIP_2	.443	.671				
GIP_3	.432	.648				
GIP_1	.381	.647				
PGB_3			.735			
PGB_4			.734			
PGB_2			.716			
PGB_1		.329	.609		.302	
SI_2				.866		
SI_1				.860		
SI_3				.745		-.317
RS_1					.780	
RS_2					.730	
RS_3			.302		.362	.652

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

Rotated Component Matrix[a] (Quartimax)

	Component					
	1	2	3	4	5	6
GIP_3	.851					
GIP_2	.845					
ISG_2	.814					
ECH_4	.790					
ECH_5	.787				.330	
ISG_1	.781					
ISG_3	.774				-.329	
GIP_1	.771					
ECH_3	.758				.344	
ECH_2	.734				.483	
ECH_1	.685				.458	
PGB_1	.621		.432			-.313
PGB_3	.603		.583			
SI_1		.840				
SI_2	.369	.835				
SI_3	.311	.712				-.348
PGB_2	.521		.613			
PGB_4	.591		.606			
RS_1	.524			.698		
RS_2	.467			.664		
RS_3	.496					.605

Extraction Method: Principal Component Analysis.
Rotation Method: Quartimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Component Transformation Matrix (Varimax)

Component	1	2	3	4	5	6
1	.543	.561	.437	.294	.315	.116
2	-.524	-.156	.230	.796	.118	.001
3	.425	.035	-.542	.498	-.370	-.375
4	.239	-.484	-.066	-.025	.723	-.425
5	.413	-.593	.066	.155	-.135	.657
6	-.151	.272	-.674	.081	.457	.483

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Component Transformation Matrix (Quartimax)

Component	1	2	3	4	5	6
1	.950	.199	.182	.148	.031	.037
2	-.259	.849	.323	.185	-.272	-.006
3	.092	.455	-.618	-.420	.321	-.351
4	-.102	-.024	-.052	.755	.484	-.426
5	-.100	.160	.164	-.088	.713	.649
6	.032	.083	-.671	.435	-.281	.522

Extraction Method: Principal Component Analysis.
Rotation Method: Quartimax with Kaiser Normalization.

Rotated Component Matrix[a] (Equamax)

	Component					
	1	2	3	4	5	6
ECH_2	.782					
ECH_1	.739					
ECH_5	.698					
ECH_3	.692					
ECH_4	.605	.432				
ISG_3		.689				
GIP_1	.332	.664				
ISG_2		.635	.316			
GIP_2	.374	.576				.420
GIP_3	.358	.550				.423
PGB_2			.761			
PGB_4			.722			.303
PGB_3			.606			.516
SI_2				.871		
SI_1				.863		
SI_3				.751		.391
RS_1					.778	.330
RS_2					.771	
RS_3		.337	.520		.540	
PGB_1			.394			.656
ISG_1		.519				.572

Extraction Method: Principal Component Analysis.
Rotation Method: Equamax with Kaiser Normalization.
a. Rotation converged in 19 iterations.

Component Transformation Matrix (Equamax)

Component	1	2	3	4	5	6
1	.457	.469	.407	.315	.385	.397
2	-.548	-.222	.175	.783	.077	.020
3	.458	.053	-.589	.509	-.427	.024
4	.218	-.653	-.316	-.027	.574	.310
5	.462	-.343	.402	.150	.039	-.696
6	-.141	.429	-.443	.078	.577	-.512

Extraction Method: Principal Component Analysis.
Rotation Method: Equamax with Kaiser

Author Note:

There are five offered rotation types (Equamax, Varimax, Quartimax, Promax, and Oblimin (Direct)). Brown (2009) noted that those rotations are differently defined in the PCA/EFA literature. Simply defining, the rotations are ways to obtain or change a set of factor loading by axes revolving. The first three types are orthogonal (statistical related, fixed angles) while the Promax and Oblimin are oblique (statistical free, non-fixed angles). A researcher may have to specify number of factors as defined in a framework (in this dissertation is 6) for simplicity. A researcher should consider all offered rotation types (includes every offered extraction methods, such as PCA, Maximum Likelihood, and so on) to compare statistical appropriateness. An arranged factor set that is similar to framework will be compatible. If an observed variable in a set carries very low factor loading or is on more than one set, it is high possibility of insufficient discriminant validity. For this thesis, Promax and Direct Oblimin are the most desirable. However, PGB set was comprised negative values in Oblimin; this is probably a mark of regressive impact when PGB is interacted with moderators. For instance, the higher the age equals the lower the regression weight.

Reference: Brown, J. D. (2009). Statistics Corner, Questions and answers about language testing statistics: Choosing the Right Type of Rotation in PCA and EFA. ***Shiken: JALT Testing & Evaluation SIG Newsletter, 13***(3), 20-25. Retrieved from: https://jalt.org/test/PDF/Brown31.pdf

Table A.4 Raw data from the optional section

Respondent Number	Statement
13	สินค้า Green IT เป็นแค่การหลอกคนที่รักธรรมชาติให้ซื้อแค่นั้นเอง
20	คนไทยทั่ว ๆ ไปยังไม่สามารถแยกแยะได้ว่าชิ้นไหนเป็นมิตรต่อสิ่งแวดล้อมและชิ้นไหนไม่ใช่เพราะไม่ได้รับความรู้เรื่องสิ่งแวดล้อมที่มากพอ รัฐและเอกชนควรใส่ใจในประเด็นนี้ให้มากขึ้น
22	ปัญหาสิ่งแวดล้อมในปัจจุบันเกิดจากความไม่ใส่ใจและตระนึกถึงผลของการไม่รักษาสภาแวดล้อม แนวทางการแก้ไขนั้นอาจจะทำได้เพียงแค่ในระยะสั้น ๆ เนื่องจากขาดความต่อเนื่องและการปลูกฝังค่านิยมที่ถูกต้อง
29	ทุกอย่างควรเริ่มจากคนก่อน
32	ใช้ถุงผ้าหรือถ้าซื้อของน้อยชิ้นก็ไม่ต้องใส่ถุงพลาสติก
52	ปัญหาเรื่องสิ่งแวดล้อม มีปัจจัยหนึ่งที่ส่งผลมากคือจำนวนของประชากรโลก จำนวนประชากรมากต้องการปัจจัยดำรงชีพรวมถึงสาธารณูปโภคมากขึ้นตาม ความต้องการเงินมากขึ้น ทำให้ต้องการงานรองรับมากขึ้นตาม ผู้ผลิตสินค้าเห็นโอกาสจากจำนวนประชากรเป้าหมาย(ผู้มีรายได้) ประชากรยิ่งมากยิ่งต้องผลิตให้พอต่อความต้องการ และเพื่อให้มีรายได้ต่อเนื่องก็ต้องกระตุ้นการซื้อให้มีต่อเนื่องเครื่องมือหลักในการขับเคลื่อนคือ การทำให้สินค้ามีความล้าสมัยตกรุ่น หรือชักนำให้กลุ่มเป้าหมายเห็นความด้อยประสิทธิภาพในสินค้าเก่าและนำเสนอสินค้าใหม่แทนที่เสมอ การหยุดกลไกกระตุ้นการซื้อสินค้าใหม่ให้หันมาใส่ใจการใช้ซ้ำ ไม่สามารถทำได้ เพราะจะมีกลุ่มอื่นเข้าแทนที่ เพราะฉะนั้นจึงทำได้เพียงการรณรงค์ แต่ที่สามารถทำได้คือการลดเลี่ยงและงดการใช้สารเคมีที่เป็นอันตรายต่อสิ่งแวดล้อม การต่อยอดการค้นคว้าวิจัยทางเคมีหาสิ่งที่เป็นอันตรายต่อสิ่งแวดล้อมในปัจจุบันและในอนาคต การบังคับใช้กฎสากลอย่างเคร่งครัดในการห้ามใช้สารเคมีหรือรังสีที่ยังไม่ได้รับการตรวจสอบอย่างละเอียดว่าปลอดภัยต่อสิ่งแวดล้อมโดยองค์กรสากลที่เชื่อถือได้เข้าสู่สิ่งแวดล้อม(ระบบ) การส่งเสริมความรู้(ระบบการศึกษา) การบำบัดสิ่งแวดล้อมที่เสีย การสร้างสิ่งแวดล้อมที่ดีเพิ่ม
53	ขยะจากบรรจุภัณฑ์อาหารที่เกิดขึ้นในแต่ละวัน มีเยอะมาก
56	เทคโนโลยีเปลี่ยนเร็วเกินความจำเป็นและผู้บริโภคก็ถูกยัดเหยียดเทคโนโลยีผ่านช่องทางต่างๆให้ละทิ้งเทคโนโลยีเก่าหันเข้าหาสู่เทคโนโลยีใหม่พร้อมกับทิ้งภาระให้สิ่งแวดล้อมโดยไม่รู้ตัว
61	อยากให้รัฐบาลสนับสนุนรถพลังงานไฟฟ้าและพลังงานน้ำ แบบแทนที่พลังงาน Fossil อย่างสมบูรณ์ เพื่อลดการนำเข้าพลังงานจากต่างประเทศลงครับ
75	การทิ้งขยะไม่เป็นที่ควรสร้างจิตสำนึกการรับผิดชอบตนเองและผู้อื่นตั้งแต่เด็ก
80	แก้วกาแฟกระดาษเปลี่ยนเป็นแก้วที่นำกลับมาใช้ใหม่ได้ รวมถึงแก้วพลาสติกอื่นๆ อาจใช้กิจกรรมส่งเสริมการขาย

Table A.4 Raw data from the optional section (Cont.)

Respondent Number	Statement
94	ปัญหาในเรื่องของสิ่งแวดล้อมต่างๆที่เกิดขึ้นอยู่ในขณะนี้ ล้วนซึ่งเกิดจากมนุษย์เป็นคนสร้างมันให้เกิดขึ้นมา เช่น ตัดไม้ทำลายป่า เผาป่า แค่นี้ก็เกินพอสำหรับการทำลายร้าง เรื่อง ของธรรมชาติมากพอแล้ว สัตว์จะสูญพันธ์หมดแล้วไม่ใช้เพราะใคร เพราะมนุษย์ล้วนๆ ถ้าหากยังไม่ยอมหันกลับดูแลรักษาสิ่งแวดล้อม ต่อไปคงเหลือแต่ตึก ไม่มีธรรมชาติให้เราได้ดื่มด่ำอีกต่อไป
98	ควรจัดสถานที่ในการทิ้งขยะ แยกแต่ละประเภท ให้เป็นสัดส่วน เพื่อสะดวกในการทำลาย
100	ไม่ใช่แค่รัฐบาลต้องให้ความรู้แต่เอกชนต้องช่วยและคนทั่วไปก็เช่นเดียวกันค่ะ
105	ก็ไม่มีไรมากแค่อยากให้ทำเหมือนประเทศญี่ปุ่น
111	กังวลในเรื่องของขยะ Power bank เพราะเหมือนเป็นแหล่งพลังงานที่ต้องใช้ร่วมกับสมาร์ทโฟนบ่อยครั้ง
119	ช่วยกันคนละไม้คนละมือประหยัดไฟฟ้า เช่นดับไฟเวลาเที่ยง
126	ควรจะมีเครื่องบำบัดน้ำเสีย เพราะประเทศเรามีแต่น้ำเน่าเสียเติมคลอง
168	ประเทศไทยไม่มีการแยกประเภทขยะอย่างเป็นระบบ ทำให้กำจัดยาก มีผลเสียต่อสภาพแวดล้อมในที่สุด
174	ต้องเพิ่มการเรียนรู้เรื่องสิ่งแวดล้อมลงไปในบทเรียนให้มากกว่านี้ ดูอย่างในหนังสือเรียนต่างประเทศ ขนาดวิชาภาษาอังกฤษยังใส่เรื่องคาร์บอนฟุตปริ้นท์ลงไปเลย
186	ให้รัฐบาลจัดการผู้บุกรุกพื้นที่ป่าไม้ภูเขาทะเลลำคลองต่างๆอย่างจริงจัง พร้อมจัดตั้งหน่วยงานขึ้นมาดูแลให้จริงจังและประเมินความก้าวหน้าทุกระยะ
195	ทุกคนต้องหันมาจริงจังกับแนวทางการจัดการปัญหามากกว่านี้ อาจมีการเพิ่ม/เน้นการรณรงค์ประชาสัมพันธ์ให้มากกว่านี้ หรืออาจมีบทลงโทษผู้กระทำผิดที่สร้างปัญหาให้รุนแรงกว่านี้ และควรมีการยกย่องชื่นชมผู้ที่มีความตั้งใจจริงที่จะแกปัญหา เพื่อสร้างความตระหนักแก่สังคม
206	ผมว่าคนไทยกับพวก สมาร์ทโฟน คนไม่ค่อยสนใจเกี่ยวกับ สิ่งแวดล้อมครับ ส่วนใหญ่คงสนใจว่าจะตอบสนองกับความต้องการตัวเองได้มากน้อยแค่ไหนมากกว่า ในส่วนเรื่องรีไซเคิล คงไม่ได้สนใจ เพราะคนไทยไม่ได้มองไกลขนาดนั้นแน่นอนครับว่า ผลิตภัณฑ์ก่อนหน้าหรือหลังจะผลิตมาจากอะไร รวมๆคือ อยู่ที่ระบบและการทำงานมากกว่าครับ
207	ปัจจัยใหญ่คือผู้ผลิตและตัวแทนจัดจำหน่าย คนจะมองไม่เห็นความสำคัญ ณ จุดนี้อยู่แล้ว ปัจจัยที่จะช่วยทำให้ลูกค้ามีความสนใจ อยู่ที่ ผู้จำหน่าย โฆษณาที่ใช้ ทำให้ลูกค้าตระหนักถึงความสำคัญของข้อนี้ให้ได้ ไม่ว่าจะด้วย นโยบาย โปรโมชั่น หรือ อะไรก็ตาม

Table A.4 Raw data from the optional section (Cont.)

Respondent Number	Statement
209	ขยะอิเลคทรอนิคส์ คงอาจจะเป็น 1 ในปัญหาอนาคต เพราะของพวกนี้ในปีเดียวก็ออกมากันมากมาย ถึงแม้ว่าจะมีการคิดค้นวิธีการดัดแปลง ปรับแต่ง ยังไง แต่สภาพของอุปกรณ์ก็ไม่สามารถบริหารการจัดการได้เต็มที่นัก สุดท้ายก็อาจจะเปลี่ยนสภาพเป็นสถานะอื่น เช่นรีไซเคิล ของประดับ หรือไม่ก็อัดถมทำเป็นผืนเกาะ แต่ก็แค่จำนวนเสี้ยวเดียวจากปริมาณทั้งหมด
210	อะไรคือ อุปกรณ์ IT ที่เป็นมิตร กับสิ่งแวดล้อม แล้วแบบไหนที่เป็นอันตราย?
211	ผมว่าเป็นมิตรกับสิ่งแวดล้อม นี่อยู่ที่ ผู้ผลิตหรือเปล่าครับ คนใช้ เค้าก็ขอ ใช้ ที่มี สเปก ดีดี ไม่ได้ ดูภาพรวมเรื่องพวกนี้เพราะถ้าดูกันแค่ ผ่านๆ มันก็เหมือนๆ กัน ทั้งหมด มันไม่ได้ต่างกันเหมือน ถุงพลาสติก กับ ถุงกระดาษ หรือ ใบตอง อะไรประมานนั้น
212	ปัจจัยที่ทำให้เลือกใช้สินค้า IT ขึ้นอยู่กับประสิทธิภาพ ราคา ความทนทาน เทคโนโลยี ถ้าหากสินค้าทั้งชนิดที่เป็นมิตรต่อสิ่งแวดล้อม และ ไม่เป็นมิตรต่อสิ่งแวดล้อม มีประสิทธิภาพเท่าๆ กัน .. สินค้าที่เป็นมิตรต่อสิ่งแวดล้อมคงมีจุดแข็งที่ได้เปรียบกว่าตรงจุดนี้ หากจะแพ้คงแพ้ที่การประชาสัมพันธ์ หรือ การโฆษณาละมังครับ (ทุกวันนี้ผมก็เลือกใช้สินค้าที่เป็นมิตรต่อสิ่งแวดล้อมนะครับ ตัวอย่างเช่น เครื่องหมายประหยัดไฟ เบอร์ 5 ก็คงมีความหมายคล้ายๆ กับ[illegible]เจ้าของหัวข้อตั้งมาประมาณนั้นมังครับ)
213	รัฐบาลควรรณรงค์และให้ความรู้ว่าเป็นมิตรต่อสิ่งแวดล้อม คืออะไร และจะได้ประโยชน์อะไรจากการอุปโภค เช่นพวกสัญลักษณ์เบอร์ 5 หรือ สติกเกอร์พิเศษ เช่น Eco Green label, etc ในขณะเดียวกับผู้ประกอบการก็ควรที่จะโฆษณาจุดเด่นในด้านนี้ให้มากค่ะ ที่ญี่ปุ่น ถ้าซื้อ อุปกรณ์พวกนี้จะได้ส่วนลด หรือสามารถทำของเก่ามาแลกซื้อของใหม่ได้ในราคาถูก อีกเรื่องคือไม่มีใครรู้ชัดเจนว่า IT product ที่เป็นมิตรฯ มันเป็นยังไงนะคะ เช่น ไม่รู้ว่าสามารถประหยัดไฟได้กี่% ไม่รู้ว่าชิ้นส่วนจะย่อยสลายได้ภายในกี่ปี หรือ ไม่ทราบว่าชิ้นส่วนจะสามารถนำกลับมาใช้ใหม่ได้หรือไม่ สิ่งที่ต้องเริ่มทำตอนนี้คือปลูกจิตสำนึกและรณรงค์และทำความร่วมมือกับ ผู้ประกอบการณ์นะคะ เช่น รัฐบาลจับมือกับ powerbuy แล้วออกโปรโมชัน ลดภาษีสำหรับ ผู้ที่ซื้อผลิตภัณฑ์ที่เป็น eco (คล้ายๆ โครงการรถคันแรก) หรือ กระทรวงอุตสาหกรรมที่เป็นผู้ออกใบอนุญาตให้ผู้ผลิต ผู้นำเข้า แก้กฎหมายให้ ผลิตภัณฑ์ IT มีคุณสมบัติเป็นมิตรกับสิ่งแวดล้อม ยังงี้ก็ได้ นะคะ ถือเป็นการบังคับที่ผู้ผลิตไปเลย ผู้ซื้อก็จะเหมือนถูกบังคับใช้ไปเลยค่ะ
216	คนมีการศึกษายังไม่รู้ว่าต้องทำอย่างไงแล้วแรงงานอย่างเราจะไปรู้อะไร
223	อะไรคือไอทีที่เป็นมิตรต่อสิ่งแวดล้อม ทุกวันนี้ยังไม่เจอทั้งรัฐทั้งเอกชนออกมาส่งเสริมประชาชนเลย
231	ปลูกต้นไม้เยอะๆ
232	อยากให้มีการรณรงค์ลดใช้ถุงพลาสติก โฟม ให้มากขึ้นและรณรงค์ให้ใช้ถุงผ้า กล่องข้าว ซึ่งอาจมีกลยุทธ์ลดราคา สะสมแต้ม สำหรับผู้ใช้ถุงผ้าหรือกล่องให้มากขึ้น

Table A.4 Raw data from the optional section (Cont.)

Respondent Number	Statement
235	ปัญหากล่องโฟมค่ะ สำหรับหนุ่มสาวออฟฟิศจะรับประทานอาหารจากกล่องโฟม วันๆหนึ่งสร้างขยะเยอะมากๆ บางร้านก็ใช้แบบกระดาษที่ย่อยสลายได้แต่ส่วนใหญ่ก็ยังเป็นโฟมที่ย่อยสลายยากและเป็นอันตรายต่อร่างกาย อยากให้คิดค้นกล่องใส่อาหารที่สามารถใช้แทนกล่องโฟมได้ทั้งหมดและราคาไม่แพงมากค่ะ รณรงค์เพื่อให้ทุกๆร้านอาหารร่วมมือกันใช้
249	ไอทีที่เป็นมิตรต่อสิ่งแวดล้อมไม่ได้ช่วยชะลอการเพิ่มของขยะได้เลย ถ้าคนอยากจะซื้อของใหม่ขยะก็ยังเพิ่มขึ้นเรื่อยๆ ส่วนหนึ่งอยู่ที่กระแสนิยมและการตลาด ปกติของมนุษย์คือไม่สนใจเรื่องสิ่งแวดล้อมอยู่แล้ว สนใจเรื่องของตนเองเป็นหลัก จริงๆแล้วการจะเพิ่มความเป็นมิตรต่อสิ่งแวดล้อมลงไปในสินค้ามันไม่จำเป็นต้องเพิ่มราคาด้วยเลย มี vat7% แล้วก็พอเอาภาษีตรงนี้ไปสนับสนุนเรื่องสิ่งแวดล้อมจะดีกว่า และยังมีอีกหลายๆเรื่องที่อยากพูดแต่กระดาษหน้าเดียวมันไม่พอให้เขียน
272	เริ่มต้นที่ครอบครัวก่อน สอนลูกสอนหลาน
280	ความรู้เรื่องสัญลักษณ์เกี่ยวกับสินค้ารักษาสิ่งแวดล้อมถ้ารู้ว่าแปลว่าอะไรก็จะมีผลต่อการเลือกใช้ในระดับหนึ่ง
298	1. ปัญหาสิ่งแวดล้อมส่วนใหญ่เกิดจากคนรวย 90 % {โดยเฉพาะธุรกิจ/โรงงานต่างๆ} แล้วมาสร้างภาพปลูกต้นไม้ช่วยเหลือสังคม10%; 2. ปัญหาสิ่งแวดล้อมส่วยใหญ่เกิดจากความละโมบเห็นแต่ประโยชน์ส่วนต้น เช่นการผลิตพลังงานแสงอาทิตย์ ต้องใช้เนื้อที่เป็น100ไร่.เท่ากับศูนย์เสียป่าไปแล้วจริงอยู่ไฟฟ้าก็สำคัญ..แล้วทำไมไม่ให้ชาวบ้านใช้คนละแผง..เพราะมันมีผลประโยชน์แฝง.. ; 3.การที่จะลดการทำลายสิ่งแวดล้อม.นั้นต้องเอาผู้ผลิตมาอบรมเกี่ยวกับจริยธรรมบ้าง.แล้วให้อยู่กับธรรมชาติสักสามปี...
308	การคัดแยกประเภทขยะเป็นแนวคิดที่ดี แต่เวลารถขยะมาเก็บมักจะเทรวมกันในรถ หรือนำขยะที่คัดแยกที่มีมูลค่าไปขายซึ่งผลประโยชน์ตรงนี้ไม่ได้กลับคืนสู่บุคคลที่ให้ความร่วมมือในการคัดแยกแต่กลับไปคืนสู่คนเก็บขยะแทน เป็นเหตุให้บุคคลมักไม่ให้ความร่วมมือในการคัดแยก แต่หากภาครัฐมีการคืนโบนัสให้กับบ้านที่คัดแยกขยะเช่นยกเว้นค่าเก็บขยะหรืออื่นๆ ซึ่งน่าจะเป็นแรงจูงใจที่ดีให้บุคคลร่วมมือในการคัดแยกเพื่อลดปริมาณขยะ
322	ควรมีการรณรงค์เรื่องการทิ้งขยะอย่างจริงจังค่ะ มีถังแยกทิ้งแต่ผลสุดท้ายก็เทรวมกันอยู่ดี และคนไทยก็ค่อนข้างมักง่าย กินตรงไหนก็ทิ้งมันตรงนั้นทั้งๆ ที่ถังขยะอยู่ตรงหน้านิดเดียว
323	การกระทำเพื่อสิ่งแวดล้อม ถ้าจะแก้ปัญหาให้ดีที่สุด ก็ควรจะเริ่มจากการมีจิตสำนึกในตนเองเป็นอย่างแรก เพราะในปัจจุบันเราแก้ปัญหากันที่ปลายเหตุ ดังนั้นเราก็เป็นส่วนหนึ่งของปัญหา เราก็ควรเป็นคนที่เริ่มแก้ปัญหานั้นด้วย

Table A.4 Raw data from the optional section (Cont.)

Respondent Number	Statement
363	สายเกินไปแล้ว รัฐก็ไม่ทำอะไร เอกชนก็ไม่สน ประชาชนก็ไม่รู้เรื่องสักอย่าง
366	องค์กรผู้ผลิตสินค้าเทคโนโลยีควรประชาสัมพันธ์ให้ความรู้เกี่ยวกับสินค้าว่าเป็นมิตรหรือมีผลกระทบอะไรบ้างกับสิ่งแวดล้อมทางสื่อต่างๆ ให้มากขึ้น เพราะผู้บริโภคบางคนไม่ทราบสิ่งเหล่านี้
370	อยากให้องค์กรและสถานที่ประกอบการมีนโยบายการรณรงค์เกี่ยวกับสิ่งแวดล้อมทั่วประเทศครับ.
392	ถ้าไม่ให้ใช้กล่องโฟมกับถุงพลาสติกแล้วจะให้แม่ค้าใช้อะไรแทน
397	อยากให้มีการปลูกจิตสำนึกในการรักษาสิ่งแวดล้อม, ส่งเสริมการดูแลรักษาสิ่งแวดล้อมเริ่มตั้งแต่ในครอบครัว, ส่งเสริมการปลูกป่าตั้งแต่ระดับครอบครัวโดยให้ครอบครัวทำกิจกรรมปลูกป่าร่วมกัน, การดูแลรักษาสิ่งแวดล้อมต้องช่วยกันทุกคน
416	จะว่าไปแล้วสินค้าละเมิดลิขสิทธิ์นี่เวลามันผลิตออกมาจำนวนมากแล้วมันตกรุ่นแต่ละครั้งมันหมายถึงการเพิ่มของขยะอิเลคทรอนิคส์ที่มหาศาลเลยก็ว่าได้ นอกจากมันจะพังง่ายแล้วมันยังซ่อมไม่ได้อีกด้วย บางครั้งนโยบายที่ห้ามสินค้าเลียนแบบนี่มันก็มีประโยชน์เหมือนกันนะในความคิดเห็นของผม
444	มกราซัมซุงออก A9 J1 กุมภา S7 มีนา J3 เมษา J5 J7 มิถุนา C5 C7 กรกฎา S7 ใหม่อีก ยังไม่ทันสิ้นปีออกมาเกือบสิบรุ่นแล้วขยะมันจะลดได้ยังไง
475	โรงงานอุตสาหกรรมเป็นสาเหตุใหญ่ที่ทำให้เกิดมลพิษ ควรมีการตรวจ ควบคุม เทคโนโลยีการแปรรูปให้มีประสิทธิภาพสูงให้ลดการเกิดของเสียและมลพิษน้อยที่สุด รวมไปถึงการควบคุมปริมาณของการใช้ทรัพยากร
482	อยากให้ช่วยกันคนละไม้คนละมือ 1 คน 1 แรง รวมตัวกันหลายคนก็เป็นหนึ่งรวมใจเพื่อโลกของเราจะได้อยู่เป็นแหล่งรวมที่พักพิงของลูกหลานในวันข้างหน้าต่อไป อยากให้ทุกคนร่วมใจปลูกต้นไม้ ลดมลภาวะเป็นพิษ ให้มีแต่สีเขียวร่มรื่นน่าอยู่แล้วสังคมในปัจจุบันจะดีกว่านี้เยอะ
484	ประชาสัมพันธ์ให้เห็นความสำคัญของสิ่งแวดล้อมที่มีผลกระทบต่อมนุษย์
495	ควรเริ่มการแยกขยะอย่างจริงจัง เริ่มที่อาคารใหญ่ บังคับทำให้ทุกคนแยกด้วยกัน จัดสถานที่ไว้พร้อมแค่แยกจากห้องทิ้งให้ถูกถังง่ายๆน่าจะทำได้. ภาคครัวเรือนเล็กๆน่าจะทำยาก ปัจจุบันcondoในกทม.มีเยอะ แค่บังคับกลุ่มนี้ก็น่าจะช่วยได้เยอะแล้ว
535	เริ่มจากครอบครัวและโรงเรียน รู้จักสอนลูกสอนนักเรียนให้รู้คุณค่าของสิ่งแวดล้อมและชี้ให้เยาวชนเห็นว่าเหตุใดเราถึงต้องรักษาสภาพของสิ่งแวดล้อมไว้ มิฉะนั้นแล้วต่อให้ทั้งเอกชนและรัฐบาลพยายามรณรงค์เรื่องสิ่งแวดล้อมให้ตายแค่ไหนก็ไม่มีผลต่อเยาวชน อนาคตของชาติอยู่ที่เยาวชน ดังนั้นจำเป็นต้องเริ่มที่เด็กก่อนที่จะยกไปเป็นวาระแห่งชาติ

Table A.4 Raw data from the optional section (Cont.)

Respondent Number	Statement
538	รัฐบาลน่าจะจริงจังให้มากกว่านี้ในการแก้ปัญหาสิ่งแวดล้อม มันเป็นปัญหาระดับชาติ
539	อยากให้รัฐบาลสนับสนุนรถยนต์พลังไฮโดรเจนอย่างเต็มขั้น เพื่อลดปัญหาสิ่งแวดล้อมได้ครับ
575	อยากให้ทุกคนร่วมมือกันรักษาความเป็นธรรมชาติของเราไว้ โดยเริ่มจากตัวเองก่อนแล้วไปบอกคนอื่น
581	ไม่ทิ้งขยะมั่วซั่ว
584	เพราะควันพิษของรถยนต์ที่ทำให้อากาศร้อนอย่างบ้าคลั่งแบบนี้
585	ทิ้งขยะไม่ถูกที่ ไม่แยกขยะ ไม่เก็บขยะ แถมรถยนต์ยังเยอะ โลกร้อน!
601	สิ่งแวดล้อมในปัจจุบันล้วนสูญเสียไปมาก และเป็นจากการทำของมนุษย์
615	ช่วยกันลดการใช้พลังงาน
627	ปัญหาสิ่งแวดล้อมในปัจจุบันเกิดจากการขาดจิตสำนึกของคน ต้องเริ่มต้นจากการปลูกจิตสำนึกก่อนให้เป็นเรื่องเป็นราว ปลูกฝังอย่างจริงจัง คิดถึงโทษที่จะเกิดขึ้นจากการทำลายสิ่งแวดล้อม
634	ปลูกจิตสำนึกก่อนแล้วค่อยปลูกต้นไม้
643	ปัจจุบันประชาชนทั่วไปยังขาดความตระหนักในการแยกขยะ ระบบบริหารจัดการขยะในหน่วยงานระดับท้องถิ่นและระดับประเทศยังไม่เอื้ออำนวย เช่น ถึงแม้ผู้บริโภคแยกขยะ แต่รถขยะก็เทรวมกันบนรถอยู่ดี และขาดการรณรงค์ให้ความรู้ในการแยกขยะ ซึ่งเป็นเรื่องพื้นฐานที่ทุกคนต้องทำ
644	ควรมีการโฆษณาแบบกึ่งบังคับ TV on Demand, นำนโยบายรณรงค์ให้เป็นวาระแห่งชาติ เพื่อให้ประชาชนเห็นปัญหา
658	การลดมลพิษ หรือรักษาสภาพแวดล้อม เป็นสิ่งที่ดี ควรมีการกระตุ้นให้มากขึ้นเพื่อให้ผู้คนเกิดความตระหนักในความสำคัญกับการรักษาสิ่งแวดล้อม การใช้อุปกรณ์เทคโนโลยีต่างๆ ไม่จำเป็นต้องลดประสิทธิภาพลงเพื่อรักษาสภาพแวดล้อม แต่เทคโนโลยีใหม่สมัยใหม่เจริญก้าวหน้าอย่างต่อเนื่อง ผู้ผลิตจึงควรเพิ่มประสิทธิภาพอุปกรณ์ควบคู่ไปกับการประหยัดพลังงานหรือลดการทำลายสิ่งแวดล้อม เช่น อุปกรณ์โทรศัพท์ที่ไม่ทำลายธรรมชาติและสุขภาพของผู้ใช้ แบตฯที่ไม่อันตรายต่อสิ่งแวดล้อมและประหยัดพลังงาน หน้าจอแสงถนอมสายตา รูปลักษณ์โทรศัพท์ที่จับถนัดมือ เป็นต้น การพัฒนาเทคโนโลยีควรควบคู่ไปกับการอนุรักษ์สิ่งแวดล้อมแต่จะไม่เป็นผลเลยถ้าผู้บริโภคไม่เห็นความแตกต่างหรือไม่ตระหนักให้ความสำคัญกับการรักษาสภาพแวดล้อม /ขอบคุณค่ะ

*All data is available at
https://docs.google.com/spreadsheets/d/19vBNwWp881hduhNc7jzEHC1l-1Xy-o_mDbDTdSUKWQA/edit#gid=157117436

Biography

Name-Surname	Mr. Pakvalit Kurkoon
Date of Birth	July 15th, 1987
Address	19/232 Moo 5 Soi Ruamchaisamakee 4, Klongtanon, Saimai, Bangkok, 10220, Thailand.
Education	2011 Master of Business Administration, Management Information System, Rajamangala University of Technology Thanyaburi 2009 Bachelor Degree of Science, Technology Computer, Rajamangala University of Technology Thanyaburi
Experiences Work	2011 - present Management, Information Technology, Sawangsin Rangnahm Ltd. Partnership.
Telephone Number	(+66) 081 402 8560 (+66) 091 740 2874
E-mail Address	pakvalit_k@mail.rmutt.ac.th hitzuja@yahoo.com hitzuja@gmail.com

Declaration

This work contains none of material that has been accepted for the award of any other degree or diploma in any university or other tertiary institution. To the best of this author's knowledge and beliefs, all materials that previously published by other people have been marked as a reference in the text.

I give permission to borrow or photocopy of this thesis, after it is available in the university library.

Pakvalit Kurkoon