Individual Green IT Readiness: Qualitative Approach

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Abstract - **This research aims to investigate the factors that drive consumers to be participated with a green IT product. A qualitative approach will be applied to screen, analyse and categorize the information. This study investigates the relationship between green IT products, attitude toward sustainable agriculture, perceived business expression, personal social responsibility, perceived government encouragement and individual g-readiness. The result shows that attitude toward a governmental encouragement and individual green product noticeability come first as major criteria. Attitude toward sustainable agriculture, attitude toward business activity and personal social responsibility are on the second stage before individual green IT readiness.**

Keywords - **Green IT Readiness, Environmental Friendly, Green Product**

I. INTRODUCTION

'Green', 'Environmental friendliness', 'Eco-friendly' and other terms, which indicate a reduction of negative impact on the environment are not new books in the library but people still have a lot to learn about these terms. 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 increase in the earth's temperature, quality and quantity of many resources utilized in our daily living are diminishing. According to Skeptical Science [1] the main problem that humanity is dealing with is that the overall global temperature has a tendency to rise in an escalator shape. What is causing the increase of the world's warming? The answer is 'human activities.' The sea level is rising on a daily basis and it bringing new disasters to our doorsteps. For instance, Ziegler et al. [2] have recorded and shown the estimated damage of the worst flood in recorded history in Thailand (2011), at about US$45 billion (or more than THB 1,394 billion) with over 500 deaths attributed. Thai people will not soon forget this grave disaster, but what is the Thai realization of the ramifications of modern human activity on this planet?

In Thailand, for most people, the word 'Green' is nothing but a colour due to less environmental dissemination in the Thai education, in media, and in sources that most people look to as a source of information (or misinformation). In this regard, Thai people do not understand their personal impact on the environment. However, there are many people becoming aware of the need for environment protection and willing to do something about it, but they know where to begin because there is no dissemination of information from the media and other sources. Generally speaking, most Thai people would be willing to become

'Green consumers' if they were aware of how and why to make green choices.

Most technology products; IT gadgets such as smartphones and tablets have an extremely long decay process; most are thousands of years. With this in mind, the amount of electronic waste (E-waste) is increasing exponentially. The long decomposition is not the only global problem, before E-wastes, hazardous chemical components have been spilling into the soil, water and air [3]. The unfortunate thing for Thai IT gadget distributors, dealers and consumers is that they do not know how and why to look for eco-friendly smartphones. This affects some elements in the supply chain of Thai businesses due to a lack of knowledge about environmental friendliness. Thai people can say that because the nation is more agricultural [4] rather technological it is acceptable that have less green IT knowledge. However, when compare agriculture vis-à-vis IT, both are generate negative impacts on the environment. Before push a business into green, a person should push his/herself into green first. Thus, study of green consumption in a consumer group is undeniably necessary.

The main goal of this study is to investigate into crucial elements which require encouraging an individual for G-Readiness. Therefore, the first study question is (1) what elements does an individual require to generate personal G-Readiness? In order to gain various ideas, an online interview method comes to play a lead role in this investigation. The second study question is related to type of main national industry, which is (2) does attitude toward main national industry affect an attitude toward individual G-Readiness? For example, Thailand has agriculture as a main industry and is effect a personal green IT consumption of Thai people? The last study question is (3) how government and business should do to encourage people to use IT product with sustainable development? To find a solution for the country to incentivize and invest into fruitful sustainable development is the purpose of the third question. According to plan, the conceptual framework is one of

productions of this study before a conclusion section.

II. LITERATURE REVIEWS

A. Thailand Background

Thai people realized that agriculture is the main industry of their country. His majesty king Bhumibol Adulyadej taught Thai people the path to sustainable development, which are the Philosophy of Sufficiency Economy (PSE) and the new theory of agriculture (based on PSE). The PSE consists of three components: moderation (neutrality and not taking advantage at the expense of others), reasonableness (rationality in decision-making), and self-immunity (being infrastructures ready for efficiently handling impacts from dynamic change) [5-7]. These are the best way for Thai people to prevent themselves from poverty and famine. The new theory of agriculture contains four benefits these are:

1) People can live moderately at an economical level, without having to starve, and can be self-reliant.

2) The water stored in the pond to support in dry season.

3) Farmers can earn income without worry about expenses in rainy season.

4) Farmers can recuperate and help themselves in case of floods [8].

The essence of PSE regarding environmental issues is to guide people to live in harmony with nature by being reasonably consume natural resources with efficency [9].

The problem is Thai farmers not follow the path of PSE and caused negative impacts on the environment. For example, the farmer used chemical fertilizer and pesticide instead of organic one that caused soil, air and water pollution [10] hazard grocery goods, and soil erosion [11].

B. Main Industry (Agriculture) vis-à-vis IT

An attitude towards agriculture and an attitude towards IT, there are a correlation

between them. Thai people been conditioned, everybody sees others eat food with less or no useful nutrition and think that fine to eat some without concerned in health and negative impact to the environment before it become the meal. Many farmers decided to use chemical components rather than organic one and that have negative impact on the nature [10]. One reason is because farmers do not study in the PSE and the new theory of agriculture carefully due to lack of government support, and consumers do not know or care what and how the farmers used to grow plants and feed animals. Likewise, people buy and use smartphone without gather information about energy efficiency, type of raw materials, green supply chain and green image of the firm, and so forth. Without the PSE, people buy such IT products without reasonableness and moderation will lead to the dramatic increasing of long-life electronics wastes. Therefore, a relationship between an attitude towards sustainable agriculture and an attitude towards green IT probably exists. In other words, if Thai people have no time to worry about Thai sustainable agriculture, will they have time to concern about sustainable IT consumption?

C. Green IT Product

Green IT is a synonym to environmentally sound Information Technology [12-13]. In this study, 'Green IT product' defined as an IT product which has less negative impact on the environment. Velte et al. [14] addressed problems as answers for the question "why we ought to buy and use greener IT products? and what is the differentiation between green IT and no green one?," which are low volume of toxins (lead, mercury, PCBs, etc.), economic power consumption, less heat emission, easier disposal difficulty in greener IT goods than IT equipments with no green sound. Toxins, plastic and metal case, such invincible components interfere with the ecosystem and reinforce to fluctuate climate change to become worse as already discussed in the introduction section.

A green IT product is different from a non-green product due to 'green design'. The 'green design' is designing any product with concern about environmentally responsible use, retirement, and disposal. There are four ideas for a green design, as follows: repairable, upgradable, minimize power consumption, and recyclable/clean disposal [14]. For example, a computer notebook, its longevity will longer if it can be repaired, user will not throw it away if it can be upgraded to match a user satisfaction, buyer will buy a power-efficiency one if he/she realized that one can help in saving electricity cost, and a recyclable one give some opportunities to customers in case of a company has 'take-back' policy.

What does the green IT product look like? Eder [15] proposed that the individual should look for the product with an eco-label, such as 'Blue Angel', stuck on its box and the product. Such an eco-label tells the consumer that this product has higher eco-friendliness than the other one which has no eco-label. This is about a noticeability of green IT product. Other attributes of green IT product are switching cost, price, trialability and green advantage.

Price is an importance thing to consumers, importance enough to encourage Venkatesh et al. [16] to add it into UTAUT2 (Unified Theory of Acceptance and Use Technology 2). Venkatesh et al. [16] reviewed three studies [17-19] as evidence to prove that price has a positive link to a chance of purchasing a technology ware. A person would not buy a green IT product if he/she feels that is an expensive one. Not only the price can play with buyer's decision, but switching cost also plays this role too. Whitten et al. [20] explicated that "switching costs represent the change in transaction costs due to structural changes in the way that IT operations are performed." In a context of end-users, for example Mrs. A used her mobile phone for four years or more, and suddenly, someone told her to go green by purchase new greener smartphone, there is only a little chance for her for buying a new one if the old one is still in acceptable condition whether it is green or not.

About the Trialability, Rogers [21] pointed out that it is "the degree to which an

innovation may be experimented with on a limited basis", and it positive relates to an innovation's rate of adoption. If people tried and demonstrated a greener tablet, and he/she perceived its green advantages, such as less energy consumption, it is probably he/she will buy one. Thus, green advantage, which cited Rogers's [21] relative advantage, became significant in green IT shopping. Rogers [21] stressed that "relative advantage is the degree to which an innovation is perceived as being better than the idea it supersedes." In this regard, green advantage in this paper defined as the degree to which an innovation is perceived as being better in environmental friendliness than the idea it supersedes.

There are many theories of IT adoption in the management of information system jug, but of course many constructs are already tested and found correlation of them. This is a reason for this study to employ some suitable constructs for utilization. Switching cost, price, trial ability, and green advantage are used as a sub-dimension of attitude toward green IT product. For other constructs, such as compatibility and complexity, there are no different between an eco-friendly tablet and a power-hunger tablet.

D. Perceived Business Expression

Velte et al. [14] have shown case studies of green business, Dell and Hewlett-Packard (HP). Dell has embraced the notion of being green in three areas: 1) environmentally friendly materials, 2) energy efficiency, and 3) recycling and recovery of end-of-life products. Dell launched a number of zero-carbon initiatives in June 2007, such as innovate 'greenest PC on the planet.' In addition, Dell try to keep consumers to watch its greener movements by educate its customers about energy efficiency as well as climate change, pollution and other environmental issues. Similarly, HP has done many environmentally friendly movements and it managed its supply chain to be a green supply chain, such as green transportation. Both of them are serious about the green supply chain.

It is significant to discuss on the green supply chain (GrSC) when investigate in environmentally friendliness, consumer, business and IT. The scope and definition of GrSCM (Green Supply Chain Management) have ranged from green purchasing to integrated green supply chains flowing from supplier to manufacturer to retailer and to end-user [22-24]. Of course, the end-user or consumer has an important duty in the supply chain, and whenever the consumer becomes more serious in an environmental concern, businesses have no choice but to manage themselves to follow the flow for stabilizing their viability in the greener marketplace. The reason why the competition in environmental friendliness, green leadership or other strategies exists in the marketplace is that the consumers have many choices today and the consumer point of view is constantly changing all the time [25].

Enabled the GrSC is not only option for a business to improve its reputation, green business practice, green IT policy, green IT product advertising, provide knowledge about environmental friendliness to the consumers are help improve its brand image as well. According to Murugesan [12], adopting green IT practices offers businesses to save some money and gain more consumer attractive. Many practitioners and researchers (e.g., [26-27]) counted an environmental concerned as one of CSR movements. Plus, Claydon [28] explained that CSR helps improve corporate image, brand reputation, and many other benefit to the firm. Thus, the more consumers realized a good business expression, the more attractive consumers to spend money on green IT products.

E. Personal Social Responsibility

As discussed early about PSE, with this methodology, Thai consumers will have guidelines for buying and using IT products with more reasonableness and more moderation. Calkins [29] explained that His Majesty King's Philosophy emphasizes and clarifies many principles that are essential to an overall national development plan, and it must be combined with other importance strategies including sustainable modernization

and technological advances. Let us develop the citizen before evolve the country, Thai consumers can adapt the PSE for their styles of IT consumption to become more eco-friendly. For instance, be reasonable purchase and use IT gadgets by consider about effects on the ecosystem as a first objective of the IT consumption.

There is a tiny conflict in this circumstance, 'should I buy a new greener laptop if the older one still functional?' If an answer is 'no', it is a good way to slow down the increasing of the E-waste but has negative impact on the environment due to unreasonable power consumption and high greenhouse gases (GHGs) emanation. On the other hand, in case of the answer is 'yes', it is good to decelerate GHGs which cause the global warming but the old energy-greedy laptop will become one of the E-waste that cause environmental problem. Here, the green IT consumption paradox revealed. The solution for this paradox is following the king's PSE for more reasonableness and more moderation. A consumer must decide that if his/her existing IT product still in acceptable status, he/she no needs to buy a new one, but if the older one is out of order, he/she has to gather information on the environmental impact of each IT product before buy one. Such behaviour called reasonableness and moderation in IT consumption, or 'Green IT consumption.'

F. Perceived Government Encouragement

It may be unfair if a government keep told that citizens should go green without their incentive embolden. To push businesses to run on the green road, a government just set laws and standards for sustainable development. In Thailand, there are Thai green label to certify an environmental friendliness to companies. Thai green label for a product, a product must pass eco-assessment by Thai green label organization [30]. This is a way to motive all industries in Thailand to be a part of sustainable development. The eco-assessment is to measure how 'green design' a product is.

However, Thai green label is not only the eco-alliance indicator in Thailand because

there are the Label No.5 and the Q-mark. The Label No.5 is for an energy efficient household utilization rather than IT products, a refrigerator, an air conditioner, and an electronic fan, for example [31]. The Q-mark is not aimed to impacts on the environmental directly since business ethic and social responsibility are included. Most of the Q-mark sticker adhesives on are grocery goods (e.g., vegetables, fruit, etc.). According to Charoensuthipan and Fredrickson [32] from the Bangkok Post, the Q-mark turn form forehand to backhand due to the discovery of some chemical component inside grocery goods. The deputy director of the Thai Holistic Health Foundation (BioThai) stated that the samples (grocery goods) had levels of pesticide contamination in its issues higher than products without the Q-mark guarantee, and this is unfair for consumers who expect safety. In this regard, Thai consumers would have bad attitude toward the other guarantees including national and international green labels as well. The credibility of green label is still high in Thai people perspective, or is not?

For consumers, green knowledge dissemination is very essential. Some influences are from media and product advertising, no news reporter present story about what happened to the eco-system in this day, few amount of green products advertising on Thai broadcasts. Such influences are not helping in generate G-readiness in Thai people. Perhaps, Thai government can set some rule to control Thai broadcasts to have some environmental program show on TV and improve Thai education to be greener.

For agriculture, as discussed early, Thai farmers have no idea how to adapt the King's PSE to learn their livings. Crop rotation, organic pesticide, organic fertilizer, soil conservation, and so forth, these things are untouchable for Thai farmers. They need some knowledge in sustainable agriculture instead of populist government activities, which solve a problem at end result rather than its origin.

G. Individual G-Readiness

G-readiness or Green IT Readiness, Molla et al. [33] defined it as "G-readiness is defined

as an organization's capability in Greening IT" into a framework which based on E-readiness framework by Molla and Licker [34]. Molla et al. [35] mixed E-readiness with environmental awareness to innovated G-readiness model, and Molla et al. [33] essayed it. Molla et al. [35] explained that G-readiness requires five components to switch it on and they are Green IT attitude (norms toward eco-sustainability and IT's role), Green IT Policy (the environmental criteria), Green IT Governance (the operating model for the administration with eco-friendliness), Green IT Practice (Pertains to the actual application and realization of eco-sustainability considerations in IT), and Green IT Technologies (IT with efficiency energy consumption).

Once, G-readiness is more innovated for an organization than an individual, and many studies (e.g., [36-38]) are invested in green IT adoption are more likely for an organization. There are numbers of studies of green individual consumption as well as study in a business context but studies of green in an individual is still need for develop various useful analytical tools for a prediction of green IT consumption in an individual. In fact, before manager push a firm to go green, he/she has to push his/herself to go green first. Devalia's [39] belief is that the implementation of PSR (Personal Social Responsibility) always supports the successful implementation of CSR (Corporate Social Responsibility) for the firm (p. 12), and in order for CSR to be successful, a viably functioning PSR must be in place. Consequently, study of green IT in the consumer context is required. With this G-Readiness for business concept, this study adapt into individual version for utilization.

III. METHODOLOGY

A. Qualitative Approach

Qualitative research method is still popular in this day as it guide social investigators to gather information as much as possible and turn them into a framework. Creswell [40] taught a quick five-step of raw data analysis, as followed: reading through all the data, categorizing text into segments of information,

labelling segments of information by codes/ID, reducing the overlap and redundancy, and collapse codes in themes. With this following sequence, all gathered information from the interview will be used to render the conceptual framework of an individual green IT readiness.

B. Consumer Online Interview

In order to gain various ideas, an online interview method comes to play a crucial role in this framework development. There were 21 interviewees in this research. We asked four questions to the interviewees through online messenger/chat applications, which were:

1) How to promote people the use of green IT products?

2) Why people hesitate to buy greener IT product?

3) What does a green IT product look like?

4) How IT manufacturers and government can do to motivate people to go green?

All interviewees' answers were analyzed and respectively summarized in to a table I, as follows:

TABLE I
THE INTERVIEW SUMMARY

Mentioned Topic	Number of Respondent	%
Noticeability	18	85.7
Government and Business	17	81.0
Price	14	66.7
Features and Performance	10	47.6
Environmental Concern	10	47.6
Advertising and Promoting	10	47.6
Durability	4	19.1
Brand Image	4	19.1
Amount of Use	3	14.2
Sustainable Agriculture	2	9.5
Switching cost	2	9.5
Model obsolete	2	9.5

IV. RESULT DISCUSSION

As mentioned previously, this study screened all gathered information from the interview, analyzed and grouped them as Creswell's [40] suggestion. There were 12

mentioned topics regarding green technological product to be concerned.

'Noticeability' was the most mentioned topics, followed by 'Government and Business.' Noticeability defined as the degree to which a product (green IT product) has the property of being easy to see and understand. Most respondents mentioned in noticeability as follows: 'does an IT product with environmental friendliness exist?' and 'Businesses and a government must promote it.' For the 'Government and Businesses', people need them to provide knowledge about the environmental issues and products that have less negative impact on an eco-system, and set more laws to control eco-friendliness of businesses.

'Price' is an important in mentioned by 66.7 percent of all respondents. Respondents believed that a person will accept those green IT products if their price is equal or lower than typical IT products, and regard to their ability as well. A cognitive trade-off between the price and the value of technological products is still the shopping touchstone (Venkatesh et al., 2012).

'Environmental Concern', 'Features and Performance', and 'Advertising and Promoting', got 47.6 percent for each of them. Environmental Concern defined as the degree to which an individual is concerned about the environment and will avoid any action which has negative impact on the environment. Tsarenko et al. [41] discovered that a personal concern for the environment has direct and indirect lead an individual to sustainable consumption, an indirect relationship require a peer to influence a person to go green. Ten out of 21 participants mentioned as Tsarenko et al. [41] discussed. About features and performance, our respondents replied that overall capability of a green IT product must have the same as an IT product. According to Rogers [21], if an eco-friendly smartphone and a non-greener smartphone have the same everything except an environmental friendliness, it means an eco-friendly one has a relative advantage overcome the other one and that help raise the

rate of adoption of a greener one. Advertising and Promoting are significant in respondents as well. Respondents suggested that businesses, which invented and distributed computer notebook, smartphone, tablet, and so forth with high environmental friendliness, have to show how their products are kindly to the environment. Likewise, promoting a green IT product is need, whether by the government or businesses, to improve a noticeability of such green product.

For 'Durability' and 'Brand Image', four answerers concerned about enduringness of green IT product and reputation of the firm. 'I believed that greener tablets strength probably lower than non-green one because of their recycled material', remarked respondents. Thus, enduringness of a green IT product is required. Moreover, good brand image help a green IT product to be more acceptable by consumers. Green IT product quality and brand images are important to build satisfaction in consumers, to lock them with loyalty [42] and spared via word-of-mouth [43].

'Model obsolete', 'Amount of Use', 'Switching cost', and 'Sustainable Agriculture' have just two mentioned respondents for each, they are not popular at all. One respondent told that the rate of adoption of technology product is rapidly climb up and quickly fall down a mountain. Regard to this movement, there are nothing but the exponentially increase of E-waste because and IT product is easy to obsolete. Amount of use is unforgettable in this context. People have to be reasonable in the using of technology products, the more they use, the more global warming, said the other participant. Regard to switching cost, the next answerer proposed that a person would not going to buy a new greener phone because the older one still in acceptable condition. The last respondent point of view is pointed to Thai agriculture, said: Thai farmers spilled too much hazard chemical into their farmland that are caused negative impact on eco-system, and Thai people are living in a hurry live, hurry enough to have no concern about meats and vegetables they are eating, thus they potentially have no concern about IT products and its environmental

friendliness.

V. DISCUSSION AND CONCLUSIONS

A. Conceptual Model

As discussed on the background of Thailand, green production, defined the junction among businesses, the government, and consumers, and other involved elements, this section will presents the framework of this study (fig. 1). This study separated the mechanism into three levels, which are acknowledged, compatible and preparation.
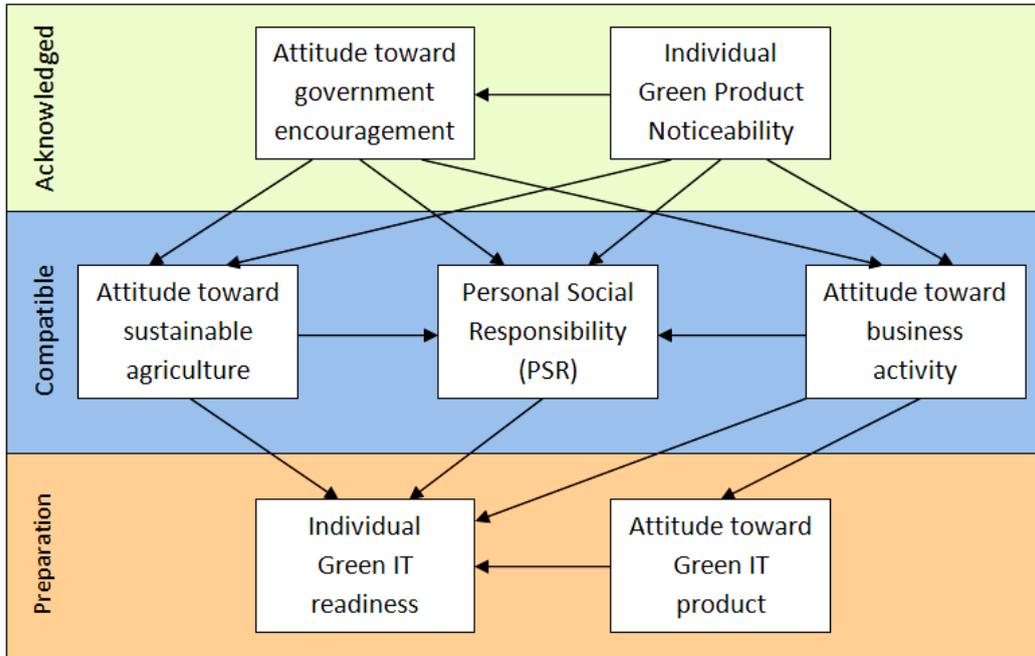

Fig. 1 Research Conceptual Framework

B. Acknowledged Level

This level contains two elements in respect to knowledge of green IT product and credibility of a government. When a consumer acknowledged that the benefits of green IT products are real, governmental persuasion can be productive.

This study discovered that attitude toward a government encouragement and individual green product noticeability are doorsteps of personal green IT readiness. From the interview, most consumers lacked of knowledge regarding eco-friendliness characteristics. Thus, they were unable to distinguish green and non-green products. We addressed this happening as major problem of sustainable development of the country. Credibility of a government was also major obstruction. Low credibility means low attitude toward a government. No matter how a government encouraged about the benefits of green IT

products, people might ignore the encouragement. With the good knowledge and the attitude, there will be no hope for national sustainable development. Therefore, a government should educate people about importance of green products, which includes technological products.

C. Compatible Level

During this level, an individual is asked about ability to obtain a green IT product, worthiness and credibility of a green IT product. Some factors were criteria of individual green compatibility.

According to the conceptual framework, the attitude toward a government and the noticeability connect to attitude toward sustainable agriculture, business activity and responsibility of oneself. Consumers saw unrespectable credibility of certifications on fresh products (Q-mark is mentioned). They also ignored product manufacturing processes.

Some consumers do not trust in public-announced environmental responsibility of businesses. These three matters lead to low credibility of a green IT product. Although he/she acknowledged the necessity of green IT product and motivated by a government, the low credibility will block his/her intention to obtain a green IT product. This is where the public and private sectors should improve their reputations. However, personal social responsibility (PSR) is always essential. PSR simply is when a consumer wants to make the world to be the better place. A person accepts eco-friendly characteristics that may not be satisfied, but will help the earth to some degree. The individual green IT readiness will not be generated if the three elements on this level are not fulfilled.

D. Preparation Level

The last stage before the use of a green IT product is good attitude toward it and personal readiness. When a consumer perceived the green certifications/labels are credible, integrated with his/her PSR, worthiness of a green IT product will be recognized. All elements are drivers of the individual green IT readiness.

This study suggests that the cooperation between the private and the public sectors is crucial for sustainable development of a country. Knowledge dissemination is absolutely required. Nevertheless, image, reputation and credibility must be improved for effectiveness of the persuasion.

VI. LIMITATION AND IMPLEMENTATIONS

This section considers limitations that may take place in this paper. There may be difficulties to enlarge the number of participants when employing the qualitative study method. However, the qualitative approach is more flexible than the quantitative one. For example, researchers can receive unexpected information, which leads to creation of new/different factors. Thus, small number of respondents was an anticipated limitation.

This study suggests the future study to focus on environmental friendly knowledge dissemination. As pointed out the problem, the lack of such knowledge pause consumers to participate with a green IT product. As a result, sustainable development will be stopped or even pushed backward.

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