

Perceived Benefit, Environmental Concern and Sustainable Customer Behavior on Technology Adoption

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Abstract. *Environmentally friendly practices in the business sector for more targeting corporations as economic actors. However, the contribution of environmental sustainability cannot only encouraged by the firm but also the consumer's participation. The eco-friendly behavior that arises from the adoption of technology by consumers is often influenced by various opposite motives. Perceived benefit is often regarded as a pragmatic motif because it is utilitarian while the environmental concern is interpreted as a form of altruism. This study aims to investigate the relevance of perceived benefit and environmental concern in the adoption of e-ticketing technology (paperless) and the dominant motive that influences consumers' sustainable behavior in adopting the technology. Data collection using paperless case (e-ticketing) to determine the motive of environmentally friendly behavior by consumers. There were 188 respondents who participated in the study. The study findings explain the importance and the corresponding conformity between the perceived benefits and the environmental concern of consumers in predicting sustainable consumer behavior in technology adoption.*

Keywords: *Environmental concern, paperless, perceived benefit, sustainable consumer behavior, technology adoption.*

1. Introduction

The rising use of technology makes business competition increasingly sticking out. Consumer activity will be more convenient and easy with the use of technology. The development of technology makes people will adopt technology in their daily activities. This is in line with the argument Zhou (2011) that there has been a rapid increase in the spread of mobile communication technology, mobile commerce worldwide. Due to the changing business environment and the ongoing information technology, the alignment of technology functions with business objectives needs to be updated and adjusted.

Technology acceptance related to the use and alignment of technological functions, often associated with the process of technology adoption. The process of technology adoption means the individual or organizational stages of deciding to use technology. Majority of studies about

technology adoption examines the adoption of technologies owned by an institution or organizational level (see Abou-Shouk, Megicks, & Lim, 2013; Roy & Sivakumar, 2007; Saeed & Abdinnour, 2013). This is allegedly due to the associated adoption of technology in organizations that focus more on information systems. Also, there are differences in acceptance of technology adoption by users which have a characteristic mandatory in organizational context whereas in the context of consumer behavior more completely voluntary (Arenas-Gaitan, Jorge; Peral-Perla, Behona & Ramon-Jeronimo, 2015; Venkatesh, Viswanath; Thong, James Y. L & Xu, 2012).

Study of technology adoption by individuals has so far focused more on its impact on the use of technology and user satisfaction (see Bhattacharjee, Perols, & Sanford, 2008; Carlsson, Carlsson, Hyvönen, Puhakainen, & Walden, 2006) and still lacking the focus on how technology plays a role in sustainable

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behavior. Whereas the impact of technology adoption leads to diverse impact, including on sustainable behavior. Study of Heiskanen, Kasanen, and Timonen (2005) with Midden, Mccalley, Ham, and Zaalberg (2008) indicates that the use of technology by consumers as a trigger of sustainable behavior. Sustainable behavior is reflected in the practice of pro-environmental or eco-friendly, ecology, and reduction of energy consumption.

The issue of environmentally-friendly in the business context for more targeting the corporation as economic actors. The companies are regarded as the party which responsible for environmental damage because it exploits the natural resources in its production process. This has led some firms to integrate environmental-friendly practices in their business planning on various environmental issues (Brown & Wahlers, 1998). However, contributing to environmental sustainability cannot only be driven by the companies but also the participation of consumers. Lockton, Harrison, & Stanton (2008), view that user behavior is a significant determinant of the environmental impact of a product because user decisions and habits ultimately have a major impact on energy or other resources used by the product. Attention for environmental issues that focus on consumer behavior very rare, whereas the study of Midden et al. (2008) with Iveroth & Bengtsson, (2014) claimed that human interaction in the use of technology will intervene to further implement sustainable behavioral practices. Hence, there is a high expectation will be in technology capability to reduce the use of natural resources more eco-efficiently (Heiskanen et al., 2005).

Sustainable behavior in technology adoption is determined by several factors, such as self-benefit and social norms (White & Simpson, 2013). The benefits consumers get when using technology will lead to sustainable behavior. It makes the perceived benefits have an impact to influence consumers' sustainable behavior in adopting a technology. This condition

makes the role of perceived benefit affecting its relationship with sustained behavior. Perceived benefits in this study include utility and economic benefits.

On the other hand, the use of environmentally friendly technology is also influenced by environmental attitudes. According to Kostadinova (2016), that environmental attitude as a factor that often affects sustainable consumer behavior. Environmental concern is interpreted as an awareness or individual knowledge that directs an individual's behavior responds to environmental changes. Sustainable consumer behaviors adopt technology in the context of this study when consumers use e-ticketing or paperless tickets. It is based that behavioral change can be achieved through the implementation of technological innovation (Spaargaren, 2011), as well as technologies and services have the potential to radically reduce the utilization of natural resources (Heiskanen et al., 2005). Therefore, it is expected that when individuals adopt the technology will have an impact on sustainable behavior in consuming energy. This study covers only ecological aspects with a focus on the use of paperless e-ticketing technology. The using of paper materials indicated has an impact on environmental sustainability.

Individual motivation in using environmentally-friendly technologies such as e-ticketing (paperless) is due to the perceived benefit and environmental concern. Both motives are considered as a trade-off. Perceived benefit is often interpreted as a pragmatic motif because it is utilitarian while the environmental concern is interpreted as a form of altruism. How is the relevance of perceived benefit and environmental concern in the adoption of e-ticketing (paperless) technology and what dominant motive influences consumer's sustainable behavior in adopting technology?

Based on the above description, the purpose of this study is to examine the motives perceived benefit and environmental concern

on sustainable consumer behavior in technology adoption and explore the dominant motives affecting sustainable consumer behavior in technology adoption.

2. Literature Review and Hypotheses Development

2.1. Technology Adoption

In the technology acceptance literature, the term technology adoption is defined as the use or acceptance of new technologies or new products. Understanding the process of innovation diffusion and the factors influencing the acceptance of new information technology users attracted the attention of researchers in various fields. Fishbein and Ajzen in 1975 introduced the Theory of Reasoned Action (TRA). According to TRA, the determinants of the behavior of individual intentions are determined by individual attitudes and subjective norms (Pavlou & Fygenson, 2006). Then refined by including perceived behavioral control as a determinant of the three individual behaviors when about to using a technology called Theory of Planned Behavior (Ajzen, 1991). Furthermore, in 1989, Davis (1989) adapted the concept of TRA and developed a model called the Technology Acceptance Model (TAM).

Theoretical foundations that researchers familiar use to describe individual behavior in technology adoption are TPB (theory of planned behavior) and TAM (Technology Acceptance Model). On the theoretical concept side, the framework (TAM) was suspected as the earliest reference to the understanding of individual or organizational behavior to adopting technologies. TAM literature shows that perceived of usefulness and perceived ease of use play an important role in influencing the intentions of technology adoption (Saeed & Abdinnour, 2013). This model describes perceived ease of use and perceived usefulness as two determinants of intentional behavior and use of technology.

The consumer of technology adoption especially e-ticketing in Indonesia, are potential markets. This is related to the high number of active smartphone users who are predicted to reach 100 million users in 2018 (Kominfo, 2018). This condition is supported by data showing Indonesia as the market with the largest online ticket transaction in Southeast Asia with a value reaching USD 8.6 billion until 2018 (Google-Temasek Report, 2018). This illustrates the high possibility of consumer behavior in Indonesia to adopt e-ticketing in paperless behavior.

Based on the study Indrawati, Raman and Chew, (2010) revealed that consumers in Indonesia are still considering price and benefits as the main factors in adopting services of mobile phones. Furthermore, Roostika (2011) suggests that in Indonesia consumer context tends to want value added of service quality on mobile internet adoption. Therefore, the existence of e-ticketing facilities using mobile devices is one of the efforts to fulfill consumer needs.

2.2. Sustainable Consumer Behavior

Sustainable consumer behavior is defined as a buying activity that is influenced by the environmental and social aspects of the consumer (Joshi & Rahman, 2017). According to Steg & Vlek (2009), the environmental behavior is any kind of behavior that changes the availability of materials and energy from the environment or change the ecosystem structure. In explaining sustainable consumer behavior practices, some researchers use various terms such as pro-environmental behavior (Steg & Vlek, 2009), sustainable consumption (Lee, 2014; Wang, Liu, & Qi, 2014) and environmental behavior (Stern, 2000) or in marketing terminology named as sustainable marketing or green marketing (Murphy, 2005). In this study will use the term sustainable consumer behavior because it focuses more on the consumption behavior of a product by consumers.

There are several theoretical approaches used to elaborate sustainable consumer behavior. For example, Theory Reasoned Action (TRA) and Theory of Planned Behavior (TPB) is considered as a framework that explains the importance of attitudes, norms, motivations, and values as a predictor of sustainable consumer behavior. This view emphasizes the intra-personal aspect. Other perspectives, such as the ABC approach (attitude behavioral context), see behavior as an interactive outcome of personal attitudes and contextual factors (Ertz, Karakas, & Sarigöllü., 2016; Kostadinova, 2016). Personal attitudes include beliefs, norms, and values for eco-friendly behavior while contextual factors such as monetary incentives, perceived costs (Ertz et al., 2016). Further, according to Ertz et al. (2016), that the growing the ABC perspective in environmental studies has an advantage in highlighting sustainable behavior.

In diverse empirical studies, there are a few factors that affect sustainable consumer behavior. For example subjective norm (sociocultural), environmental concern, perceived marketplace (personal factor) (Joshi & Rahman, 2017). In another study, Lee, (2014) put contextual (sociocultural) and personal factors (environmental concerns) as a predictor of sustainable consumer behavior. Meanwhile, Milfont and Markowitz (2016) assume that sustainable consumption occurs at an individual and contextual stage of behavior.

Furthermore, Kostadinova (2016), views among the many factors that influence sustainability behavior can be categorized into two, related to individual attitudes and context/situational. Moreover, according to Ertz et al. (2016), that contextual factor is perceived by the consumer. Situational context is associated with the external availability of access and economic conditions. In addition, in the marketing literature, there are two ways to increase consumer engagement. First, consumer involves environmentally friendly actions if

accompanied by the benefit obtained. Second, the engagement of environmentally friendly practice due to social norms (White & Simpson, 2013). Therefore, the recent study considered perceived benefit (contextual factor) and environmental concern (personal factor) as a predictor in explaining sustainable consumer behavior.

Eco-friendly consumer activity will minimize resource consumption. Technology is seen as having a contribution in reducing the use of natural resources. However, there is often a paradoxical pattern of behavior in technology adoption when consumer behavior does not align to the level of technological sophistication (Nanggong, 2018). This is reflected when the behavior of the use of paper is still high while technology has given the features of e-ticketing for paperless solution. Meanwhile, Midden et al. (2008) describes the persuasive role of a technology in evaluating sustainable behavior. This is in line with the study of Heiskanen et al. (2005) found the technologies and services have the potential to radically reduce the utilization of natural resources. Therefore, the adoption and diffusion of technology should stimulate the presence of sustainable consumer behavior.

2.3. Perceived Benefit

In the study of technology acceptance and information systems, term perceived usefulness and perceived ease of use are considered to be associated with the perceived benefit (Pei, Wang, Fan, & Zhang, 2015). The term perceived usefulness shifts toward perceived benefit to accommodate the socio-economic benefits (Lee, 2009). Perceived usefulness is meant as the existence of an aspect of the performance is perceived by users (Venkatesh, Thong, Chan, Hu, & Brown, 2011). According to Park, Park, & Lee (2014), perceived benefit refers to the user's belief in the positive impact of the use of information systems technology. Lee (2009) assumes that the perceived benefits describe aspects of financial benefits obtained by consumers. Meanwhile, Pei et al. (2015) view that the perceived benefit is influenced by ease

of access, usefulness and financial benefits. Therefore, the construct of perceived benefit in this study covers the positive impact of easy to use, usefulness and financial benefit in the use of technology.

The benefits of technology relate to the inherent automation processes in the application thereby contributing directly to cost and time savings (Alam, Khatibi, Ismail, & Ahmad, 2005). Furthermore, technology users also hope to use mobile services without much effort and intricacy (Zhou, 2011). If these expectations are fulfilled then the process of technology adoption becomes facile. This shows the role of perceived ease of use is very significant to utilizing of technology.

In the context of the applied of e-ticketing, consumers will use paperless tickets if they have acquired benefit from the technology. The benefits of e-ticketing technology include the utility, convenience and financial benefits that consumers obtain. Various results study indicate the advantages of using mobile system technology (see Alam et al., 2005; Lee, 2009; Park, Yang, & Lehto, 2007; Wang, Sy, & Fang, 2010). This illustrates that the perceived benefit will lead individuals to adopt technology-based systems such as e-ticketing.

Furthermore, the perceived benefit and perceived financial or costs in the marketing literature are identified as customer value. Kotler and Keller (2012) say that customer value is a comparison between benefits received and costs incurred. Consumer behavior uses the product is influenced by utilitarian and functional dimensions. Further, according to Wang et al. (2010) that the perceived benefit is the application of functional, cost and emotional value. In other words, the motive of consumer behavior that considers aspects of benefits and costs is more pragmatic. Adoption of paperless or e-ticketing technology by consumers will be interpreted as taking advantage of the product.

2.4. *Environmental Concern*

The term “environmental concern” is often identified with ecological, ecocentrism and anthropocentrism consciousness (see Dunlap, Van Liere, Mertig, & Jones, 2000). Ecological problems arise largely because of values, attitudes, and beliefs of people (Dunlap & Van Liere, 1984). This set of values, attitudes, and beliefs at the socio-cultural level is known as the Dominant Social Paradigm (DSP) concept. The occurrence of a crisis of environmental concern because of the value of individualism, freedom, and increased materialism that is no longer adaptive to the limitations of ecology. DSP elements tend to have a negative relationship with environmental sustainability.

Furthermore, Dunlap and Van Liere (1978) put forward different views of the DSP with the term NEP (New Environmental Paradigm). This concept identifies a set of core values that emphasize attention to natural limitations and the importance of maintaining a natural balance due to adverse human actions and impact on environmental damage. Therefore, the concept of NEP has three dimensions: the balance of nature, the limits of growth and the nature of human domination. Environmental psychology studies generally make the NEP a general assessment and become popular in measuring environmental concerns (Dunlap et al., 2000; Poortinga, Steg, & Vlek, 2004). This makes the NEP measurement indicator recognized to reflect the pro-environment orientation.

Following Dunlap and van Liere's findings on NEP, several studies have investigated the relationship between values and behavior. Studies Stern & Dietz (1994) demonstrate values, beliefs, attitudes, and behaviors as personal preferences that are emphasized in their actions to protect the environment. This is in line with suggesting by Dunlap and Van Liere (1984) that the cultural core values and beliefs determine an individual's attitudes. The findings of Stern and colleagues are called VBN (value-belief-norm) theory. This concept explains value orientation which

consists of openness to change, altruistic value, egoistic and traditional/biospheric (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). This theory is widely used in consumer behavior that emphasizes the importance of values, beliefs, and attitudes in creating pro-environmental action (Ozaki, 2011).

Therefore, this study places values, beliefs, and attitudes in the constructs of environmental attitude variables or termed environmental concerns. Environmental attitudes as a predictor of sustainable consumer behavior in technology adoption. Consumers who use mobile phone devices in accessing e-ticketing are regarded as individuals who are concerned about the importance to reduce the use of natural resources (paperless). The use of indicated paper material has contributed to the emergence of natural damage.

2.5. Hypotheses

The term perceived benefit in this study refers to the usefulness, convenience and financial benefits that a person obtains when using technology. The usability is based on the performance of a technology perceived by the user. Someone using a mobile phone for the e-ticketing process will get the ease of use with a relatively low cost. The automation process attached to the e-ticketing technology system will directly impact on cost savings, time, quick service and ease of access.

Perceived benefits in adoption and technology literature are considered to be motivated to use technology because of the ease, usefulness and economic benefits (see Lee, 2009; Pei et al., 2015; Wang et al., 2010; Zhou, 2011). Meanwhile, the behavior of energy consumption is also determined by the costs, benefits, and preferences of individuals in which rational consumers decide based on all the information available to them (Loock, Staake, & Thiesse, 2013).

E-ticketing technology deals with the process of using tickets without paper or paperless materials. In other words, the adoption of e-

ticketing technology means an individual effort to reduce the consumption of paper materials derived from nature. Several studies have also shown that the adoption of mobile technology devices is influenced by the perception of benefits and finance (see Lee, 2009; Pei et al., 2015; Yu, 2012). Based on the above description, then proposed that:

H1: *“Perceived benefit has a positive effect on the sustainable consumer behavior in technology adoption”*

The term environmental concern in this study refers to individual values, beliefs, and knowledge about the environment. Environmental concern is often exchanged for its meaning with environmental attitudes and ecocentrism. The existence of a consumer's knowledge about the importance of natural balance will manifest in his pro-environmental behavior (Coelho, Pereira, Cruz, Simões, & Barata, 2017). It can also apply to consumers behavior in adopting the technology. A strong value orientation can lead a person to gain information about environmental conditions and act on environmental protection (Stern & Dietz, 1994). The findings of Kilbourne & Pickett (2008) reveal that the desire for behavior change is related to the high level of attention to environmental issues. An environmentally friendly technology is easily accepted by individuals with high environmental awareness.

Ecologically conscious consumers behavior prefer to use paperless e-ticketing technology rather than conventional ticketing. In another sense, the environmental concern will affect a consumer in the use or adoption of technology. Various studies also show significant environmental concerns in predicting sustainable consumer behavior (See Joshi & Rahman, 2017; Lee, 2014). Therefore, hypotheses are designed as follows:

H2: *“Environmental concern has a positive effect on the sustainable consumer behavior in technology adoption”*

3. Methodology

This research is explanatory in nature designed to test the effect of perceived benefits and environmental concern on sustainable consumer behavior. The samples in this study are consumers who use mobile phone devices in the e-ticketing process with paperless. The data were collected from March until May 2018 using an online questionnaire that is spread to several regions in Indonesia. Sampling technique using purposive sampling with certain criteria, namely respondents were chosen who had used the e-ticketing process with mobile phone applications without a print-out paper ticket. In order to increase the response rate of respondents combined accidental and snowball sampling method with help from a few colleagues to share the online questionnaire application due to the lack of data on the number of e-ticketing users. Total questionnaires were successfully filled by respondents as many as 199 questionnaires, but there were eleven

questionnaires that did not meet the criteria to 188 (usable rate 94%).

Demographic data of respondents consisting of gender, age, educational background, profession, and respondent's residence. Table 1 illustrates the characteristics of the respondents who participated in the survey. The composition of respondents by gender consists of men as much as 45.21% while women 54.79%. Age category of respondents dominated 73.40% among the youth of 21-30 years at once shows so familiarly the use of mobile phone devices in the young people. The educational background of respondents, most of which are undergraduate and graduate are about 45% and 38%. In terms of the occupational of the respondents, most professions are in the private sector and students (28.72% and 30.85%). All the respondents spread in all regions in Indonesia but the highest participation was 39.89% and 36.70% came from respondents who domicile in Sulawesi and Java Bali Island.

Table 1.
Profil Respondents

Description	Number of respondents	Percentage (%)
Gender		
▪ Male	85	45.21
▪ Female	103	54.79
Age		
▪ <21	15	8
▪ 21-30	138	73.40
▪ 31-40	29	15.42
▪ >41	6	3.20
Education		
▪ High School	24	12.76
▪ Diploma	5	2.65
▪ Bachelor Degree	85	45.21
▪ Master	69	36.70
▪ Doctor	5	2.65
Professions		
▪ Civil Servant	30	15.96
▪ Private Sector	54	28.72
▪ Entrepreneur	22	11.70
▪ Student	58	30.85

▪ Others	24	12.77
Residence		
▪ Sumatera	21	11.17
▪ Java & Bali	69	36.70
▪ Kalimantan	11	5.85
▪ Sulawesi	75	39.89
▪ Maluku/Papua/Nusa Tenggara	12	6.38

The variable measurement instrument consists of three variable constructs operationalized in several question items. All measurement instruments were adopted by previous research to improve content validity.

Table 2.
Variable and Measurements

Variable	Indicator	Source
Perceived Benefit	1. Using a mobile phone helps me accomplish things more quickly	Cheng et al. (2006) in Lee, (2009); Venkatesh et al. (2003); Yu, (2012)
	2. I find mobile phone device very useful in my daily life	
	3. mobile phone makes easier for me to carry out my tasks.	
	4. I find mobile phone easy to use	
	5. I skillful using mobile phone device	
	6. The features of the mobile phone is clear and understandable.	
	7. The cost of using E-ticketing is lower than using a conventional ticket.	
	8. charges for internet data packages in accessing E-ticketing are relatively cheap.	
	9. The process of accessing E-ticketing on mobile phones take cost is relatively low	
	10. Using mobile phone services is reduce cost burden to me.	
Environmental Concern	1. Most environmental problems can be solved by applying more and better technology.	Milfont and Duckitt, (2010)
	2. Science and technology will eventually solve our problems with diminishing resources.	
	3. Science and technology do as much environmental harm as good. (R)	
	4. We can keep counting on science and technology to solve our environmental problems.	
	5. Humans will eventually learn how to solve all environmental problems.	
	6. The belief that advances in science and technology can solve our environmental problems is completely wrong and misguided. (R)	
	7. Humans will eventually learn enough about how nature works to be able to control it.	
Sustainable Consumer Behavior	8. Modern science will solve our environmental problems.	Van de Kerk and Manuel (2008)
	1. Using e-ticketing/paperless will effect to personal development (eco-friendly lifestyle) positively.	
	2. Using e-ticketing/paperless will effect to healthy environment positively.	
	3. Using e-ticketing/paperless will effect to sustainable use of resources positively.	
	4. Using e-ticketing/paperless will effect to sustainable world positively.	

Variable perceived benefit using an instrument from Venkatesh, Morris, Davis, and Davis, (2003), Cheng, Lam, & Yeung (2006) in Lee, (2009), Yu (2012). Variable Environmental Concern adapts a scale developed by Milfont and Duckitt (2010). The measurement of Sustainable Consumer Behavior adapted to scale from Van de Kerk and Manuel (2008). All of these items were modified in e-ticketing or paperless contexts and using a five-point Likert-scale from point 1 indicates strongly disagrees up to point 5 (strongly agrees).

Data were analyzed using multiple regression analysis to test the relationship between variables of the developed model. Instrument reliability evaluation using Cronbach alpha

with cut-off value 0.6 (Hair, William, Babin, & Anderson, 2014) while checking the validity through confirmatory factor analysis (CFA).

4. Finding and Discussion

4.1. Evaluation of Measurement Model

Testing of measurement instruments was conducted to ensure the feasibility of the instruments used in this study. The research instrument is considered adequate if it meets the valid and reliable elements in the test. Testing the validity and reliability is the first part that needs to be done in quantitative research before testing the hypothesis.

Table 3.

Descriptive Statistics

Variable	Mean	SD	PB	EC	SB
Perceived Benefit (PB)	4.091	0.529	1		
Environmental Concern (EC)	3.794	0.620	0.465	1	
Sustainable Consumer Behavior (SB)	4.156	0.700	0.507	0.541	1

Note: all variables correlation at $p < 0.01$

Source: Primary Data, processed (2018)

Descriptive data show responses from respondents on several variables. The response value of the perceived benefit and sustainable consumer behavior is at a value above 4 illustrating the high benefits that consumers derive from the practice of using e-ticketing. The environmental concern response got a score of 3.7. All significant variables were positively correlated between the values of 0.46 and 0.54. Respondents assessed the correlation of environmental concern on sustainable consumer behavior slightly higher than perceived benefit.

4.2. Reliability Test

Testing instrument reliability is intended to ensure the internal consistency of an instrument in measuring a research variable. The reliability test method by evaluating the Cronbach alpha value is at least 0.6-0.7 (Hair

et al., 2014). The result of the instrument test indicates that all research instruments are found to meet reliable requirements with coefficient value > 0.80 (see Table 4).

4.3. Validity Test

The measuring instrument is considered good when it meets the validity of the required criteria. To that end, in evaluating instrument validity, a factor analysis or confirmatory factor analysis (CFA) is conducted. Factor analysis is considered relevant in identifying and validating measurements in an indicator construct. Indicators are said to be feasible if they are gathered and integrated into a factor and have significant estimates. The rule of thumb required in the minimum loading check is > 0.4 is categorized eligible (Tabachnick & Fidell, 2013). In a series of factor analysis

tests, there are finally four items that need to be dropped because they do not meet the criteria. The result of the factor analysis test

(see Table 4) shows that the variable indicator has a loading factor > 0.4 and is considered valid.

Table 4.
Reliability and Validity Test

Variable	Cronbach Alpha	Item	Loading factor
Perceived Benefit	0.825	PB01	0.780
		PB02	0.781
		PB04	0.721
		PB05	0.727
		PB06	0.668
		PB07	0.478
		PB09	0.411
		PB10	0.514
		Environmental Concern	0,839
EC02	0.808		
EC04	0.714		
EC05	0.721		
EC07	0.567		
EC08	0.724		
Sustainable Consumer Behavior	0,934	SB01	0.808
		SB02	0.874
		SB03	0.848
		SB04	0.839

4.4. Hypotheses Testing

As described earlier, to answer the research objectives, two hypotheses are proposed. The hypotheses constructed in the study to explain the perceived benefit and environmental concerns of sustainable consumer behavior in technology adoption. Hypotheses test results are shown in Table 5. The results of this study provide support for the research model developed. The evaluation of the structural model ensures that the relationship between research variables is considered fit by checking the coefficient of determination. The magnitude of variance that explains the research model is shown with R^2 is 37.6%. Although the value is categorized as modest, it is reasonable because there are only two predictors used among many factors that explain sustainable consumer behavior.

perceived benefit has a positive and significant influence on sustainable consumer behavior in technology adoption (see $\beta = 0.32$; $t = 4.96$; $p < 0.01$). These results indicate that the benefits that consumers derive from the use of technology lead consumers to behave sustainable in technology adoption. Therefore, this finding makes hypothesis 1 supported.

Table 5 also shows the testing of hypothesis 2. The results testing of Hypothesis 2 proved to be supported ($\beta = 0.39$, $t = 5.94$; $p < 0.01$), thus confirming the positive significance of environmental concern effects on sustainable consumer behavior in technology adoption. These findings show that with attitudes, values, and beliefs about the importance of environmental sustainability, consumers will behave in an environmentally friendly practice when adopting a technology product.

Based on hypothesis test results in Table 5 shows that hypothesis 1 which states that Table 5.

The result of Hypotheses Testing

Hipotesis	Variable	β	t	Result
H1	PB > SB	0.326*	4.963*	Supported
H2	EC > SB	0,390*	5.948*	Supported
R Square		0.376		
F		55.768*		

Note: * $p < 0.01$

As expectations in earlier that technology has a significant role in creating sustainable consumer behavior. The findings of this study provide an explanation of a consumer's motives in behaving pro-environment when adopting a technology. The results to explain that the usefulness and financial benefits that consumers gained when use technology improve their consumption behavior on eco-friendly products. This is in accordance with previous studies concerning the perceived importance of convenience, benefit for consumers in consuming a service or sustainable product (Lee, 2009; Vermeir & Verbeke, 2006; Wang et al., 2014).

Furthermore, personal factors such as environmental concern from consumers also contribute to creating sustainable behavior. The existence of beliefs and knowledge possessed by consumers about the importance of improving the quality of the environment will lead an individual to consume service technology products that are environmentally friendly. This study is consistent with previous studies that environmental concern is the main predictor of sustainable consumer behavior (Dietz, Stern, & Guagnano, 1998; Kilbourne & Pickett, 2008; Lee, 2014). The results of this study confirm some researchers' assumptions about the causal factors of environmental behavior in terms of personal values (environmental concern) and contextual (cost and self-benefit) (see De Groot & Steg, 2010; Stern, 2000). Perceived concerning the benefits and environmental concerns of consumers is considered to be an important antecedent as a consumption preference in environmental behavior. In solving research objectives on dominant

motives that affect sustainable consumer behavior. The results of this study show that environmental concern (personal factor) has greater strength than perceived benefit (contextual factor) in directing behavior. This finding is slightly different from studies Lee (2014) and Joshi & Rahman (2017) claimed environmental concerns to have minimal impact on sustainable consumer behavior. In the current study, environmental concern predicts stronger sustainable behaviors when low costs. A few studies also reveal that the reasons for an individual to consider environmental concerns and engage in pro-environmental action to raise their status (Noppers, Keizer, Bolderdijk, & Steg, 2014; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). For example, a person is motivated to adopt a sustainable innovation (i.e., e-paperless) to be viewed as a person who has a great concern for the safety of the environment. The findings of this study are consistent with previous research that greater environmental value or attributes predict sustainable product adoption compared to perceived benefits (De Groot & Steg, 2010; Noppers et al., 2014).

Another reason why personal factors such as environmental concerns affect greater than perceived benefits is thought to be due to the contribution of respondents' demographics. Approximately 85% of respondents have a higher education level. Educational factors are considered to contribute and positively correlate to sustainable consumer behavior (Milfont & Markowitz, 2016; Wu, Zhou, & Song, 2016). Highly educated individuals have the awareness and knowledge of maintaining and consuming environmentally friendly

products (Dietz et al., 1998). Associated with age factor (around 73% younger), there are several views that adult individuals are more intent on sustained behavior (see Luchs & Mooradian, 2012; van Biljon & Kotzé, 2008) but age effects vary widely in various studies. For example, Lee (2014) describes how young educated consumer substantial to engage in sustainability consumption. Young educated people are now becoming aware of the problems and future of the environment (Connell, Fien, Lee, Sykes, & Yencken, 1999), more accepting of new innovations (e.g., e-ticketing) (Lee, 2014), and are very familiar with the use of mobile phone technology as a paperless instrument (Nanggong, 2018). This concludes that age factors are patterned inconsistently in various studies and tend to be obscured by the level of education.

Furthermore, interesting matter detected that the two predictors proceed simultaneously when compared with studies that often expose the occurrence a conflict of interest between pro-environmental behavior motivation (See De Groot & Steg, 2010; Steg et al., 2014). Motivation benefit as a contextual factor is considered more pragmatism and gain goals while environmental concern is personal and more altruism or normative goals. Thus, these two characteristics are considered opposite (*Vis-à-vis*) (Steg et al., 2014; Steg & Vlek, 2009). However, based on VBN theory, environmental concerns not only contain altruistic and biospheric bases but also egoistic motives (De Groot & Steg, 2010; Stern et al., 1999; Stern & Dietz, 1994). The practice of using e-ticketing or paperless with mobile phones is contaminated with egoistic orientation elements due to economic considerations. A situation in hedonic and gain goals would be more supportive than conflict with normative goals (environmental concerns) in encouraging sustainable behavior (Steg et al., 2014). This condition occurs in the context of environmental behavior practices that have a direct impact on personal or private spheres such as purchasing organic goods, recycling waste plastic bottles (Kilbourne & Pickett, 2008; Wang et al., 2014).

At this point, it explains why environmental concerns and perceived benefit congruence. Steg et al. (2014) argue that normative values don't necessarily conflict with benefit and gain motivation but rather as consequences arising from individuals engaging in the pro-environment behavior.

Theoretical Implications

This research reinforces some theoretical concept such as goal setting theory, VBN, TPB and ABC theory in explaining the rise of environmental behavior practices by consumers. According to Steg et al. (2014), there are three motivates behind the action of pro-environmental behavior namely hedonic goals (e.g., pleasure and enjoyable), gain goals (e.g., save money), and normative goals (e.g., environmental knowledge). Correspondingly, VBN theory also emphasizes the importance of values (i.e., altruism, egoistic and biospheric) underlying the emergence of sustainable behavior. The findings of this study also to strengthen the perspective of TPB that focuses on intrapersonal aspects such as attitudes and values adopted by an individual in creating eco-friendly behavior and perceived behavioral control (perceived benefit) have a direct impact on the creation of sustainable behavior. In addition, the results of the study are in line with the ABC theory, that sustainability behavior occurs because of the interaction between personal attitudes and contextual factors perceived by consumers. This research contributes to integrating multiple perspectives and different domains (personal and contextual factors) simultaneously.

5. Conclusion

The recent study introduces the importance of perceived benefits and environmental concern of a consumer in shaping sustainable behavior on technology adoption. The results indicate that the adoption of technology products in sustainable consumer behavior can exist if consumers gain benefit and also describe that environmental concern is the

main predictor of sustainable consumer behavior.

This finding provides additional insight into those perceived benefits and environmental concerns are not the opposite of creating pro-environmental behavior. This is often described as a pragmatism vis-à-vis altruism attitude. Both of these can be aligned in creating eco-friendly behavior depend on the circumstance or context of mutual support. The use of e-ticketing or paperless on the one side provides ease and financial benefits and on the other hand, demonstrate the practice to reduce using natural resources.

This study will be useful for the firm to consider in using paperless in order to minimize cost and reduce natural resource in Indonesia with deciding their strategic initiatives. The firm based on ticketing system needs to adjust their business processes with changes in consumer behavior that are increasingly familiar with the use of mobile devices in accessing a service. E-commerce business competition can create customer benefit because it is easier and cheaper. In addition, the increase in environmentally friendly issues should stimulate the firms to offer a sustainable consumption model to consumers.

Although the study provides an overview of the significance of perceived benefit and environmental concerns in sustainable behavior. But it has some limitations, *first*, it is important to note that this study takes the case of the use of technology in relation to paperless. On the other hand, e-ticketing practices based on mobile phone devices by consumers are related to the use of electricity that is not very environmentally friendly. It needs further research to examine the sustainable consumer behavior in the context of electricity consumption in the use of technology as a challenge paperless behavior. *Second*, environmental concern variables are treated as a single construct in this study. However, the literature reveals an environmental concern covering egoistic,

altruism, and biospheres that have different motivational characteristics (see De Groot & Steg, 2010; Stern & Dietz, 1994). Therefore, it is suggested in the next research that it is important to identify the fittest domain of environmental concern in predicting pure environmental behavior.

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