The Influences of Consumer Preference Characteristics towards Green Product: A Case of Naturemill Bin

S.K. Mustafa[2], H. Musa[1,2*], A.R. Abdullah[3] and F.R. Azmi[2]

[1]Centre for Technopreneurship Development (CTeD)
[2] Faculty of Technology Management and Technopreneurship (FPTT)
[3]Centre for Robotics & Industrial Automation (CeRIA),
Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya,
76100 Durian Tunggal, Melaka, Malaysia.

*Email: *haslindamusa@utem.edu.my*

Abstract—**Despite a widespread adoption of green technology reported in many scholars, we continue to witness disappointing performance outcomes from their implementation. This can be explained largely by the failure of many studies to translate the initial adoption decision, made at an individual-level acceptance of a technology to be used by human. This study examines the key antecedents of the Technology Acceptance Model for users expected to use a naturemill bins in their day-to-day activities. In this study, we apply and extend the Technology Acceptance Model (TAM) to examine factors that influence acceptance of naturemill bins by individual users. Our focus is on the potential role of user-perceived naturemill bins quality dimensions as antecedents to the TAM's cognitive mechanisms of perceived usefulness and perceived ease of use (PEU), and the user's trust in using it. Our results confirm the core TAM relationships within the naturemill bins context and (PEU) found to be the most significant influencer of the consumer acceptance towards green products (Naturemill bin).**

Index Terms—**Technology, Green Product, Sustainability.**

Article history: Manuscript received 5 September 2017; received in revised form 5 October 2017; Accepted 6 October 2017.

I. INTRODUCTION

Environmental practices have been well studied but only a few studies have presented the green innovation practices of corporate firms [1], [2]. In the past years, our earth facing critical pollution problem, about 40 percent of deaths around the world can be attributed to air, water and soil pollution. The Blacksmith Institute and Green Cross Switzerland ranked the planet's most severe pollution threats and the health problems associated with them [3], [4].

The latest reading of the rate pollution in the world, Malaysia is one of the countries with high readings of the pollution of 67.37 percent [5]. Malaysia as one of the developing countries usually will construct and build big amount of pollution and definitely will make negative impact when forest needs to be sacrificed for the sake of attaining developed country. According to Oluwasola Omoju [6], developed countries have the resources and technologies to combat pollution. As a result, impact of these developed countries will make pollution and will lead to many diseases. Melaka is one of the smallest states in Malaysia with only 160,000 hectares of land area. The researcher finds out that if all the resources are not to be managed appropriately, the state will in future face many difficulties. The solution of using green product is proposed, and anticipated that all trash could be dispose eventually without generating bad odors, which could attract maggots and worms. Bad odors will produce high concentration of the Carbon

dioxide (CO2) and the high concentration will lead into many more environmental problems. Worst, it will also affects the whole ecosystem. As we can see, the food left over will produce high concentration of gas of carbon dioxide (CO2). The leftover food also had big impact when it will generate the greenhouse effect if it allowed the heat-trapped released to environment [7], [8], hence leading to many other causes that can destroy the environment.

A. Consumer

According to InvestorWords [9], consumer is someone who can make the real decision whether they will choose to make a purchase of items in the store and can possibly be a person who can be influenced by marketing and advertisement.

B. Consumer Acceptance

According to S. Glenzer [10], the term "acceptance" of a particular commodity as most frequently measured involved either a measured of those quantities bought or of the number of consumers who buy the commodity when the "usual" alternatives offered in conjunction therewith, and the price and income structures are known and fixed.

C. Technology Acceptance Model

This theory explained how the customer will accept the product. The technology acceptance model (TAM) explained user acceptance of a technology based on user perceptions [11]. The mediating roles of perceived usefulness (PU) and perceived ease of use (PE) examined in the relationship between external variables and the intention of system usage. Based on the D. Yen et al., [12], TAM was about the situation where the consumer is willing and intends to accept the technology. R. Ozaki and K. Sevastyanova [13] supported this factor, where the most important adoption consumer factor was economy and motivator includes current cost energy, availability of an effective and easiness in using the technology, besides convenience incentive for consumers to change.

D. Perceived Ease Use

According to [14], perceived ease of use is the degree to which a person believes that using a particular system would be free effort. PEU are inherent users' beliefs that are crucial in determining their intention to adopt a particular technology [15]. Perceived ease of use (PEU) had been demonstrated in the previous research as the power to sway the behavior of the consumer [16].

E. Perceived Usefulness

Perceived usefulness (PU) is known as "the degree to which a person believes that using a particular system would enhance his or her job performance [14]. PU is also defined as the degree to which a person believes a technology improves job performance [17].

F. Perceived Trust

The action of belief that someone or something is reliable, good, honest, effective, etc [14], [18]. It is strongly recommended that trust should also be examined as a driving factor in the area of mobile commerce[19].

G. Green Product

Consumers and manufacturers have directed their attention toward environment friendly products that are presumed to be "green" or environment friendly like low power consuming (energy-efficient) electrical appliances, organic foods, lead free paints, recyclable paper, and phosphate free detergents [20].

II. METHODOLOGY

A survey questionnaire is used to collect the data. Data were collected both online and offline. The amount of the sample that researcher used was 100 people. According to Heir et al., [21] the general rule of the minimum ratio of observation for independent variables was 5:1.

A. Research Design

The descriptive study is used to gain the data information base on the organizational situation, the background of respondents which

will be respect of variables that entangled in the situation.

B. Methodological Method

The researcher use quantitative method. This method is provable by using statistically. According to C. Williams [22], Quantitative research is 'Explaining phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics)'. Quantitative method is used in this research to understand the relationships of all variables towards the acceptance of use of a naturemill bin and understanding the behaviors of the acceptance.

C. Data Collection

The researcher used both the primary and secondary data. The primary data were collected by when the questions tailored until elicit so the data will help them with the research [23]. The data were collected within Melaka area.

D. Pilot Test

Pilot test is to finding out the survey, key informant interview guide or observation form will work in the "real world" by trying it out first on a few people. The amount of the respondent for pilot test is 25 people from all area Melaka. The purpose of pilot test is, it aiming to know how far the understanding respondent towards the questionnaire.

E. Research Framework

A research framework or conceptual framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought [24]. This framework will find out the relationship between those preference characteristics that will influence the accepting of consumer.

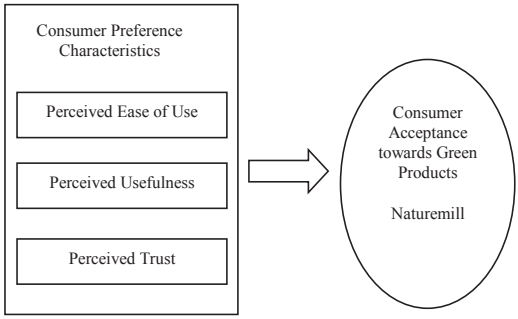

Fig. 1. Conceptual Framework

F. Time Horizon

The researcher use the cross-sectional studies because this method is about to make a strategy in condition for collecting the available data to be used in this research towards getting positive or negative results. The researcher approached public following their convenience.

IV. RESULTS AND DISCUSSION

A. Pilot Test

TABLE I. CRONBACH ALPHA FOR ALL VARIABLES STUDIED

Variable	Cronbach's Alpha	N of Items
PEU	0.954	5
PU	0.946	5
PT	0.918	5
CA	0.811	3

TABLE I. above show the amount of Cronbach's Alpha for PEU = 0.954, PU = 0.946, PT = 0.918 and CA = 0.811. All the Cronbach's alpha for the reliability test for pilot test is highly correlate because has amount over than 0.8 – 0.9, so the correlation it classified as the excellent.

TABLE II. VALIDITY OF ALL ITEMS STUDIED

	No. of question	Value	Critical Value	Validity
IV1	1	0.947	0.381	Valid
	2	0.885	0.381	Valid
	3	0.962	0.381	Valid
	4	0.770	0.381	Valid
	5	0.959	0.381	Valid
IV2	6	0.928	0.381	Valid
	7	0.887	0.381	Valid
	8	0.937	0.381	Valid
	9	0.861	0.381	Valid
	10	0.949	0.381	Valid
IV3	11	0.831	0.381	Valid
	12	0.786	0.381	Valid
	13	0.963	0.381	Valid
	14	0.895	0.381	Valid
	15	0.885	0.381	Valid
DV	16	0.942	0.381	Valid
	17	0.697	0.381	Valid
	18	0.937	0.381	Valid

TABLE II above shows all the validity test value to be >0.381(critical value), so all the question in this research is suitable to be used for this research.

B. Descriptive Statistics

TABLE III. DESCRIPTIVE STATISTICS OF RESPONDENTS

	Frequency	Percent
Male	47	47.0
Female	53	53.0
Indian	93	93.0
Chinese	3	3.0
Malay	3	3.0
Other	1	1.0
45-54	62	62.0
35-44	27	27.0
25-34	2	2.0
Under 25	9	9.0
SPM	21	21.0
STPM/Diploma	16	16.0
Degree	56	56.0
Others	7	7.0
Private	16	16.0
Government sector	13	13.0
Student	57	57.0
Self-employment	14	14.0
City area	51	51.0
In suburban area	14	14.0
Outside city/ village,	35	35.0
Everyday	66	66.0
Every 3 days	21	21.0
Every 7 days	13	13.0
Dumping together with regular waste	65	65.0
Burn the food waste	8	8.0
Give the leftovers to feed pet	20	20.0
other	7	7.0

TABLE III above shows that respondent consists of 47% male and with 53% female respondents. Based on the result, it states that female's respondents are more than male respondent in Melaka. Majority of the respondents are from Malay race with 93%. This is followed by 3% of Chinese and Indian with 3 respondents from both race and lastly, only 1% of the other race. The majority of the respondents is under the age of 25 years old (62 respondents), followed by the age between 25 until 34 years old (27 respondents). Next, the percentage of age between 45 until 54 years old is 9%. The last but not least is the age around 35 until 44 with only 2 respondents. The highest value of percentage for the academic level is that majority of the respondents own degree, while the rest are students. Next, it followed by the private sector with 16 %(16 respondents), self-employment with 14 %(14 respondents). This self-employment probability they have their own business. The last, with the least percentage is from government sector with only 13 %(13 respondents). For the place for respondents, majority of the respondents are living in city area with the highest percentage, 51% respondents. Next, the second highest percentage is the respondents from outside city or lives in the village around Melaka with 35%, 35 respondents from 100 respondents. The last but not least, with the least percentage is the

respondent live in suburban area with only 14% (14 respondents). More than half of the respondents always segregate their food waste in everyday with 66%. Followed by 21 % of the respondent will segregate their food waste in every 3 days in a week. The last but not least, only 13 % of the respondents segregate their food waste in each every 7 days. the method of the respondents used to dispose their food waste, majority of the respondents with 65% had disposed their food waste by using dumping together with the regular waste. Next, the second method that usually respondent use is gives the leftover to feed their own pet with 20%. Followed by 8% of the respondents burn the food waste and 7% of the respondents use the other method.

C. Validity

The researcher found out the critical value of the N=100 respondents as the reference for the critical value. The critical value for this test was 0.195, so the correlation of the question s must be greater than the value of critical value, 0.195. The amount of *X1.*1 is 0.859, *X1.*2 is 0.854, *X1.3* is 0.869, *X1.4* is 0.845 and *X1.5* is 0.898. For IV2 Is *X2.1* is 0.868, *X2.2* is 0.849, *X2.3* is 0.814, *X2.4* is 0.825 and *X2.5* is 0.830. For IV3 *X3.1* is 0.848, *X3.2* is 0.752, *X3.3* 0.875, *X3.4* 0.771, *X3.5* is 0.857. The last but not least, DV=y1 is 0.953, y2 is 0.817 and *Y3* is 0.960. Based on the amount all 18 question get value greater than the amounts of critical value, so all the questionnaires at above was considered valid.

D. Reliability

TABLE IV. CRONBACH'S ALPHA RELIABILITY

Cronbach's Alpha	N of Items
.968	18

The Cronbach's Alpha reliability coefficients of the three independents and dependents was 0.968 was nearly to 1.0 expressed as the excellent results based on the internal consistency .Therefore, this data may be acceptable . According to Vieira (2016), the maximum value of cronbach's alpha was 1 and the minimum value was 0 but, however when the alpha value was very high as (0.95 >) cause by the a few issues, when the number of issue increase, the value of Cronbach's alpha value tends to increase, it can also the correlation between the question was increase. Other than that, the value of pearson correlation for x1.1=0.834, x1.2=0.835, x1.3 0.802. This amount shown the correlation between IV ans DV was strong. Each of the value has (**) highlight the probability of the correlations coefficient was less than 0.01.

E. Multiple Regression Analysis

The value of R=0.863 and R Square = 0.745 The coefficient of determination was R^2,it's measured the propotion of the variation in a dependent variable consumer acceptance towards green product (Naturemill bin). The range of R^2 is between 0 and 1 (Saunders et al, 2012). From the results, it shows the value of R^2 was 74.5% of the variables affected the relationship between the consumer acceptance toward the green products (Naturemill bin) and this means 25.5% from the other factor of the consumer to accept the Naturemill bin. ANOVA; the significance level was 0.000 (p = 0.000) which was below than 0.05, therefore it was statictically significant (Laerd Statistics, 2013). Thus , it shown the questionnaire were accepted and researcher was support the significant of relationship between IV and DV.

The coefficients of the variable all are significant with value P = < 0.05. PEU with 0.010, PU with 0.014 and the PT with value 0.023. The unstandardized Coefficients which, constant is 0.291, PEU with 0.358, PU with 0.350 and PT with 0.276. The simplify equation for this coefficient has shown below:

Y *Consumer Acceptance toward green products (Naturemill product)* = 0.291 + 0.359 Perceived ease of use + 0.350 Perceived usefulness + 0.276 Perceived trust

PEU had significant positive influence towards CA, from the value above, the amount of PEU (t = 2.628, p = 0.010, β= 0.358) and it will lead the increasing of the acceptance of Naturemill bin towards public in 0.358 units. PU had the positive influence towards CA

when the value of significant was positive value and less than 0.05. The value (t = 2.515, p = 0.014, β= 0.350). It will lead the increasing of the acceptance of Naturemill bin towards public in 0.350. PT had the positive influence towards CA. The value of (t = 2.311, p = 0.023, β= 0.276). It can be explained by every one unit increased in PT will lead the increasing CA.

F. Descriptive Analysis

For IV1, PEU standard deviation for each questions *(X1.1=0.85375, X1.2=0.75905, X1.3=0.79544, X1.4=0.76779, and X1.5=0.70667)*. For IV2, PU standard deviation for each questions *(X2.1=0.85493, X2.2=0.94281, X2.3=0.83509, X2.4=0.82993 and X2.5=0.7529)*. For IV3, PT standard deviation for each questions *(X3.1=0.79239, X3.2=0.84781, X3.3=0.82168, X3.4=0.7829 and X3.5=0.81965)*. The last variable for DV *(Y1=0.89126, Y2=0.66485 and Y3=0.91293)*.

G. Hypothesis Testing

Hypothesis 1

***HA: H_0 rejected while H_1 was accepted**

The value of (R = 0.834) and (R^2 = 0.695), There the researcher concluded that 69.5% the proportion of the CA. From that, it shows the correlation between PEU and CA. The ANOVA table shows, the significant value was 0.000. This value was less than 0.05 because of the value of (p < 0.05). PEU have impacts towards CA.

H_0: PEU does not affect the CA

H_1: PEU affects the CA

Hypothesis 2

***HA: H_0 rejected while H_1 was accepted.**

The value of (R = 0.835) and (R^2 = 0.696), There the researcher concluded that 69.6% the proportion of CA. From that, it shows the correlation between PU and CA. The ANOVA table shows, the significant value was 0.000. This value was less than 0.05 because of the value of (p < 0.05). PU have impacts towards CA.

H_0: PU does not affect the CA

H_1: PU affects the CA

Hypothesis 3

***HA: H_0 rejected while H_1 was accepted.**

The value of (R = 0.802) and (R^2 = 0.644), There the researcher concluded that 64.4% the proportion of the CA. From that, it shows the correlation between PT and CA. The ANOVA table shows; the significant value was 0.000. This value was less than 0.05 because of the value of (p < 0.05). The PT had impact towards CA.

H_0: PT does not affect the CA

H_1: PT affects the CA

V. CONCLUSION

It was found that, out of the three (3) main factors that influences the acceptance of the consumer on the green product (Naturemill bin) (PEU, PU and PT), PEU had the highest amount of beta value, hence indicating its most influencing factor. Perceived ease of use is the degree to which a person believes that using a particular system would be free effort, and that the acceptance was influenced by age. PEU was a more important factor for older people in providing enjoyment and flow experience of using a new technology such as the naturemill bins. Similarly, PEU was more important among women than men for enjoyment. PEU are inherent users' beliefs that are crucial in determining their intention to adopt a particular technology. This research has proven previous studies on the Perceived ease of use (PEU), which demonstrated as the power to sway the behavior of the consumer. In addition, the results of the value for correlation coefficient with inclination to the value of 1 makes all the three (three) factors as influencer to the consumer decision making in accepting the Naturemill bin.

The limitation in this research was the difficulty in getting trust from the respondents, where the majority of the public respondents do not utterly answer the questionnaire which leads to unsatisfactory answers. In future, it is important for researchers to clarify the effects of the products in supporting green technology or how it could possibly assure its sustainability. Lastly, the researchers may consider other external factors, such as satisfaction or enjoyments that may influence the decision of acceptance among consumers.

ACKNOWLEDGEMENT

The authors would like to thank Universiti Teknikal Malaysia Melaka (UTeM), specifically to the Center for Technopreneurship Development (CTeD) for all supports in completing this research.

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