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Sustainable Smart Homes and Community Happiness in the Malaysian Context

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ABSTRACT

Sustainable smart houses are one of the methods through which all these factors can be touched upon because such houses provide social well-being and cause less damage to the environment. Therefore, this study analysed the predictors of purchase behaviour of sustainable smart houses and their impact on community happiness. Among the predictors which are part of this study include attitude, subjective norms, perceived behavioural control, cost, intention, and social media networks. Data were collected through a questionnaire survey from 187 Malaysian respondents, and SmartPLS was used for data analysis. Results revealed that purchase of sustainable smart houses does have an impact on community happiness. It establishes the extent to which community well-being has been prioritised by local property developers. In addition, it suggests strategies to help these developers to materialise the goals of smart and sustainable property development focusing on community well-being.

KEYWORDS

Attitude, Community Happiness, Cost, Perceived Behavioural Control, Smart Technology, Social Networks, Subjective Norms, Sustainable Smart House

INTRODUCTION

The goal of an individual's life is to achieve happiness which is referred to as good feeling(s) and enjoyment (Layard, 2003). Happiness is achieved through day-to-day activities performed by humans as reported by Lyubomirsky (2007) that 40% of the happiness is related to activities performed on a daily basis. Among those, the majority of them are related to home-based activities as humans spend most of the time at home. An individual gets an environment to be happy through socialization and relaxation at home (Corrigan-Doyle, Escobar-Tello & Lo, 2016) which is indispensable for a happy life.

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Happiness is not only important for an individual but also for community (Muaremi, Arnrich and Troster, 2012).

Since the building block of community happiness is an individual, therefore it is very important to improve the daily life of an individual in order to make him/her satisfied and that will lead to family and community happiness. This is possible through the use of technology in the house. Technology helps in ease of communication with each other and making life easier from different perspectives like automatic switch-off lights to save energy. Such objectives can be fulfilled by the construction of sustainable (eco-friendly) smart houses. These houses help in protecting the environment through the efficient use of resources and energy conservation besides providing a comfortable living environment inside the house through the use of Information and Communication Technology (ICT) (Blumendorf, 2013). Through the construction of those houses which are providing a comfortable living and at the same time protecting the environment helps in sustainable living which leads to community happiness. This has also been reported that smart houses not only improve the quality of life but also help in improving environmental conditions (Tetteh & Amponsah, 2020). Unfortunately, little research has been carried out on smart eco-friendly houses and their impact on community happiness. This research will focus on analysing the factors which are necessary to measure the behaviour of purchasing smart eco-friendly houses and the impact on community happiness.

LITERATURE REVIEW

Smart House

With the innovations and development in ICT, now the focus has shifted towards such houses that are not only sustainable but at the same time are smart or intelligent. Smart homes include the control and connectivity of appliances used within the house and also act in a certain way depending on the situation (Karkar and Gandhi, 2018). Various definitions exist emphasizing what makes a house to be smart or intelligent. One of the popular definitions of smart house is "*A dwelling incorporating a communication network that connects the key electrical appliances and services, and allows them to be remotely controlled, monitored or accessed*" (King, 2003).

Based on this definition, it can be inferred that a smart house consists of those devices which are able to do networking, controlling other devices and automation (Chernbumroong, Atkins & Hongnian Yu, 2010; Jiang, Liu & Yang, 2004). Networking devices help different devices to communicate with each other. Furthermore, controlling devices basically manage the entire system and automation devices help in monitoring the physical environment (Sripan, Petchlorlean & Ketcham, 2012). Another definition of smart home was proposed by Intertek, (2003) which describes a smart house consisting of a communication network which connects electrical appliances and allows controlling, monitoring or accessing those devices.

SUSTAINABLE SMART HOUSE

Household sector is among the top sectors, including energy and transport sectors which cause emission of greenhouse gases (UBA, 2011). To overcome such challenges, from the last few years, the concept of smart cities is on the rise across many countries in the world. This is because of the economic, environmental and social benefits associated with such cities (Zhou, Li, Chan, Cao, Kuang, Liu, Wang, 2016). As one of the crucial building blocks of smart cities are homes, therefore smart homes should be constructed in such a way that they are sustainable and eco-friendly in order to fulfil the environmental benefit of smart cities. Therefore, many researchers are carrying out studies on the use of sustainable smart houses. For example, Fitriaty, and Sugihara (2018) concluded that smart and sustainable houses have certain common characteristics based on user respect, saving water and energy and environment friendly.

One of the critical benefits of these houses is the smart usage of electricity which helps to achieve sustainable environmental benefits through intelligent demand response (Zhou et al., 2016). This is achieved through monitoring of devices based on a user's preference and usage in order to save and utilize energy efficiently (Vojdani, 2008; Farhangi, 2009; Zhang, Li & Bhatt, 2010).

Smart houses in the future will offer new possibilities for automation to enhance the comfort level of residents and without compromising the environment by efficient utilization of energy (Kamilaris & Pitsillides, 2013). Other main benefits of sustainable smart houses include quality health care (Czaja, 2016); reduction in medical errors (Cavicchi and Vagnoni, 2017), financial benefits in terms of cost saving (Balta-Ozkan et al., 2014); affordability (Khedekar et al., 2017) and technology utilization (Marikyan, Papagiannidis, and Alamanos, 2019).

HYPOTHESES DEVELOPMENT

Attitude and Purchase Intention of Sustainable Smart House

Attitude refers to the assessment of an individual towards behaviour. This assessment can be positive or negative (Ajzen, 1991). This makes attitude as the key indicator of intention and behaviour because if the attitude of a person is positive towards behaviour, chances to perform that behaviour will be high and vice-versa. Studies have found a positive relationship between attitude and purchase intention which ultimately leads to behaviour (Shaw & Shiu, 2003). This means that higher the attitude of a person towards behaviour, the higher will be the intention. Few researchers showed a positive relationship between attitude and purchase intention of organic products (Teng & Wang, 2015) and green buildings (Liu et al., 2018). Based on this theoretical support, it is hypothesized that:

H_1: Attitude towards purchase of sustainable smart house will positively affect the intention to purchase sustainable smart house.

Subjective Norms and Purchase Intention of Sustainable Smart House

Subjective norms refer to the social pressure that can encourage or discourage a person to perform or refrain from his/her behaviour (Nguyen, Nguyen & Nguyen, 2019). In Theory of Planned Behaviour (TPB), Ajzen mentioned that subjective norms will have a positive impact on intention. However, to date, empirical investigations showed mixed and even no relationships between subjective norms and purchase intention. For example, Van et al. (2009) concluded that there is a strong and positive impact of subjective norms on purchase intention. However, Tarkiainen and Sundqvist (2005) and Chen (2007) reported weak and no relationship between subjective norms and purchase intention. This can be explained by the varying characteristics of the population or context of the study. Thus, it is important to empirically test this relationship in the context of this study. But in general, the higher the social pressure (subjective norms) to buy sustainable smart houses, the higher will be the purchase intention. Therefore, it is hypothesized that:

H_2: Subjective norms will positively affect the intention to purchase sustainable smart house.

Perceived Behavioural Control and Purchase Intention of Sustainable Smart House

Perceived Behavioural Control (PBC) refers to the perception of ease or difficulty with which a person can perform the behaviour (Nguyen, Nguyen & Nguyen, 2019) or in other words it can be referred as a control of an individual to perform the behaviour (Ajzen, 1991). Higher PBC results in higher chances of intention to perform the behaviour because an individual may assume that there are fewer difficulties in performing the behaviour. Tan (2013) reported that there is a positive relationship between PBC and green residential buildings. However, there are a few studies like Abdullah et al.,

(2014) where it is concluded that there is no significant impact of PBC on purchase intention. Due to these contradictory results, it will be worth investigating the impact of PBC on purchase intention of sustainable smart houses. Therefore, it is hypothesized that:

H_3: Perceived Behavioural Control will positively affect the intention to purchase sustainable smart house.

Cost and Purchase Intention of Sustainable Smart House

Cost is referred to as the amount of money a person has to pay (Hsu, Chang & Yansritakul, 2017) in order to purchase or acquire a product or service. Cost is considered as one of the barriers to make a decision in order to perform the purchase behaviour. Abdullah et al., (2014) reported cost as a barrier or obstacle to organic food consumption. However, the relationship between cost and purchase intention is not simple as it can serve as a double edged sword. If the cost of a sustainable smart house is high, it may not remain affordable for most of the population and at the same time if the cost of such houses is kept low then people may assume that quality will be low (Schuitema & Groot, 2015). Therefore, to encourage home buyers to purchase sustainable smart houses rather than conventional houses, it is important to provide these houses at an affordable price (Moser, 2016). Therefore, it can be concluded that if the cost of a sustainable smart house is high, people may not be able to purchase it and their purchase intention will be low due to affordability and vice-versa depending on the availability and higher benefits associated to the environment and society. Thus, based on the literature support, it is hypothesized that:

H_4: Cost will negatively affect the intention to purchase a sustainable smart house.

Intention and Purchase Behaviour of Sustainable Smart House

Purchase behaviour or actual behaviour depends largely on the intention to perform that behaviour. If the intention or willingness to perform the behaviour is high, probability of performing that behaviour will be very high as well (Zheng, Cheng & Ju, 2019). Although it was reported in the original theory (TPB), that intention will lead to actual behaviour. However different studies showed that it is not always the case. Few studies showed that there is no relationship between intention to perform behaviour and the actual behaviour itself due to intention – behaviour gap (Grunert and Juhl, 1995). However, there are many studies like Sheppard et al., (1988) and Thøgersen, (2007) where it is concluded that there exists a strong relationship between intention and purchase of organic food. Therefore, for this study, it is hypothesized that:

H_5: Purchase intention will positively affect the intention to purchase sustainable smart house.

Moderating Role of Social Networks between Intention and Purchase Behaviour of Sustainable Smart House

Social media refers to "*consumer-generated media that covers a wide variety of new sources of online information, created and used by consumers intent on sharing information with others regarding any topic* of interest" (Kohli, Suri & Kapoor, 2014). Social media is providing new ways through which organisations can reach out to their customers by providing information about the products or services (Naylor, Lamberton, & West, 2012) in a much more effective and personalized manner. For example, electronic word of mouth (eWOM) is one of the methods through which information can be disseminated to millions of customers in a matter of hours which is beyond expectations if compared to traditional media. Social media is not only helpful in creating awareness (Kaeding, Schmalter, & Klika, 2017) but Powers, Advincula, Austin, Graiko & Snyder (2012) have found that customers

think social media played an important role in their final purchase behaviour. As social media helps in creating awareness that results in purchase behaviour, therefore, it is hypothesized that:

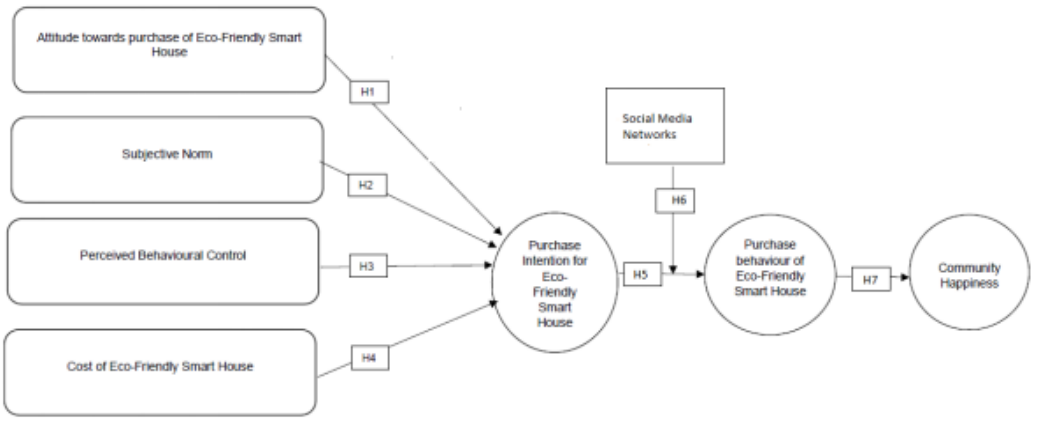
H_6: Social media positively moderates the relationship between intention and purchase sustainable smart house behaviour.

Purchase Behaviour of Sustainable Smart House and Community Happiness

Happiness refers to satisfaction of desires (Kashdan, Biswas-Diener & King, 2008). Various factors exist which may increase or decrease the happiness level and among the main factors is the living environment (Insu, 2016). Sustainable or green houses provide good well-being (Shier & Graham, 2015), health (Richardson, Pearce, Mitchell & Kingham, 2013) and social cohesion (Kabisch, Qureshi & Haase, 2015). Since individuals spend most of their time at home with other family members, therefore a sustainable house is considered crucial to influence the happiness of an individual and the entire family. As individuals make the community, therefore if individuals living in a sustainable environment or residential buildings are happy then chances are the community will be happy as well. Recent studies have shown a positive link between sustainable communities and happiness (Cloutier et al., 2013). As sustainable houses which are smart helps in improving the well–being through social equity and environment protection (Yiing, Yaacob, & Hussein, 2013), thus it can be concluded that those communities which live in sustainable smart houses are happy and it can be hypothesized that:

H_7: Sustainable smart house purchase behaviour will have a positive impact on community happiness.

Figure 1. Research Framework



RESEARCH METHOD

This paper's argument is based on Icek Azjen's Theory of planned behaviour (TPB). Silva, Canavari and Wander (2017), the most appropriate theory to apply when a study discusses purchase intentions is TPB. Further, in TPB an intent to engage in a behaviour influences an individual's behaviour whereby intention reflects by attitude, subjective norms and perceived behavioural control. Hence, TPB has bridged the constructs by focusing on the purchase intent of house buyers towards green

and sustainable houses. According to Walzberg, Dandres, Merville, Cheriet and Samson (2020), under agent-based modelling and commonly TPB is often applied to set up agent's behavioural rules.

To ensure that there is no validity concern, items used to measure variables were adapted from previous studies. Language of the questionnaire was English. All the items were measured using a 5-point Likert scale. Table 1 shows the information about the total number of items used against each variable and the source of the items.

Table 1. Instrument Development

Variable	Number of Items	Source
Attitude	7	Liñán & Chen, (2009); Burton, Lichtenstein, Netemeyer & Garretson, (1998)
Subjective Norms	7	Fitzmaurice, (2005); Al-Swidi, Huque, Hafeez & Shariff, (2013)
Perceived Behavioural Control	6	Maichum, Parichatnon, & Peng, (2016); Paul, Modi, & Patel, (206)
Cost	5	Suki, (2013); Ghodrati, Samari & Shafiei, (2012)
Intention	6	Dodds, Monroe & Grewal, (1991); Liñán & Chen, (2009); Voon, Ngui & Agrawa (2011)
Social Media Network	6	Ahmed & Zahid, (2014)
Community Happiness	7	Hegner, Fenko & Teravest, (2017)

DATA COLLECTION

Self-administered questionnaire was used to collect the data. Data were collected from Perak, Kuala Lumpur, Pulau Pinang, Johor and Selangor areas of Malaysia. 600 questionnaires were distributed. 310 questionnaires were returned out of which 123 were discarded due to a lot of missing values. 187 (31.1%) questionnaires were used for further analysis.

DATA ANALYSIS AND RESULTS

Data analysis was carried out in two stages. During the first stage, demographic data was analysed by using frequency and percentage methods. During the second stage, Partial Lease Square Structural Equation Modelling (PLS-SEM) was used to further analyse the data. Measurement model analysis was carried out to ensure reliability and validity of the instrument. Structural model analysis was carried out to check the relationship between variables and their significance. Smart PLS3 was used for both types of analysis.

RESPONDENTS' PROFILE

As shown in table 2, most of the respondents (60.4%) were female, followed by male (39.6%). More than 41% respondents were young adults with an age of less than 30 years old whereas 21.9% respondents belonged to the 30 – 35 years age group followed by 36 – 40 (17.1%) and more than 40 years (19.3%) old age group. Most of the respondents had bachelor's degree (45.5%) followed by diploma (15.5%) thus showing that respondents were well educated. As far as location is concerned, more than 34% were from Pulau Pinang, followed by Kuala Lumpur (21.4%), Selangor (15.5%) and

Johor (7%). Majority of the respondents were earning less than RM 3,000 per month (38.5%) whereas the second highest income group was between RM 3,000 – RM 5,000 (29.4%) income range, followed by RM 5,000 – RM 8,000 (24.6%) and more than RM 8,000 comprising 7.5% of total respondents. More than 51% respondents were Chinese, followed by Malay (39%) and Indians (7.5%). Lastly, a big chunk of respondents was involved in the marketing profession (30.5%) followed by academicians (13.4%). Please refer to table 2 for further details about demographics.

Table 2. Respondents' Profile

Measure	Item	Frequency	%	Measure	Item	Frequency	%
Gender	Male	74	39.6	Income	Less than RM 3,000	72	38.5
	Female	113	60.4		RM 3,000 - RM 5,000	55	29.4
Age	Less than 30 years old	78	41.7		RM 5,000 - RM 8,000	46	24.6
	30 -35	41	21.9		More than RM 8,000	14	7.5
	36 - 40	32	17.1	Ethnicity	Malay	73	39.0
	More than 40 years old	36	19.3		Chinese	97	51.9
Education	Primary	3	1.6		Indian	14	7.5
	Secondary	29	15.5		Others	3	1.6
	Diploma	29	15.5	Profession	Academics	25	13.4
	Bachelor's Degree	85	45.5		Medical Doctor	2	1.1
	Master's Degree	21	11.2		Banker	6	3.2
	PhD	12	6.4		Lawyer	2	1.1
	Others	8	4.3		House Developer	4	2.1
Location	Kuala Lumpur	40	21.4		Technologist	7	3.7
	Selangor	29	15.5		Student	8	4.3
	Johor	13	7.0		Marketing	57	30.5
	Pulau Pinang	65	34.8		Others	75	40.1
	Others	40	21.4				

MEASUREMENT MODEL ANALYSIS

Confirmatory Factor Analysis (CFA) was performed to analyse the reliability and validity of the measurement model. To ensure there is no issue with the measurement model, outer loadings, Cronbach alpha, Average Variance Extracted (AVE) and composite reliability (CR) analysis were performed. All values of outer loadings were more than 0.70 and Cronbach alpha was also more than 0.70 for each variable thus establishing that there was no reliability issue (Nunnally & Bernstein, 1978). Similarly, all AVE values were more than 0.60 thus establishing convergent validity (Bagozzi & Yi,

1988). Composite reliability values were more than 0.8 and therefore internal consistency is reliable (Nunnally & Bernstein, 1978). Table 3 and Figure 2 show the details of all these results.

To test discriminant validity, the square root of AVE was calculated and no such issues were found. Please refer to table 4 for further details.

Figure 2. Measurement Model

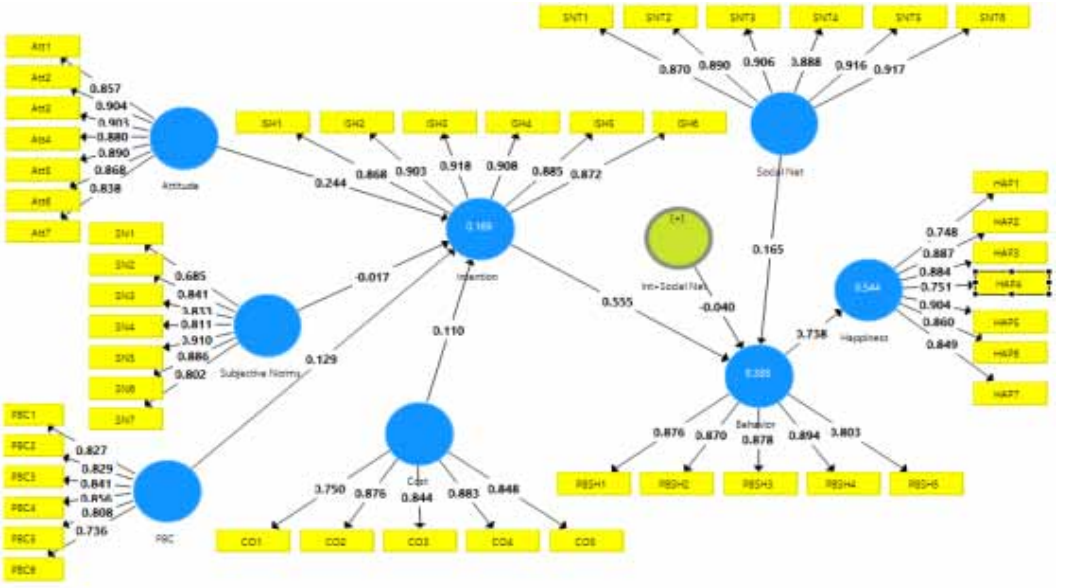


Table 3. Reliability and Validity

Construct	Items	Standard Loading	Cronbach Alpha	CR	AVE
Attitude	Att1	0.857	0.950	0.959	0.770
	Att2	0.904			
	Att3	0.903			
	Att4	0.880			
	Att5	0.890			
	Att6	0.868			
	Att7	0.838			
Cost	CO1	0.750	0.897	0.923	0.708
	CO2	0.876			
	CO3	0.844			
	CO4	0.883			
	CO5	0.848			

Table 3 continued on next page

Table 3 continued

Construct	Items	Standard Loading	Cronbach Alpha	CR	AVE
Happiness	HAP1	0.748	0.931	0.945	0.710
	HAP2	0.887			
	HAP3	0.884			
	HAP4	0.751			
	HAP5	0.904			
	HAP6	0.860			
	HAP7	0.849			
Intention	ISH1	0.868	0.949	0.959	0.796
	ISH2	0.903			
	ISH3	0.918			
	ISH4	0.908			
	ISH5	0.885			
	ISH6	0.872			
Perceived Behavioural Control	PBC1	0.827	0.901	0.923	0.668
	PBC2	0.829			
	PBC3	0.841			
	PBC4	0.856			
	PBC5	0.808			
	PBC6	0.736			
Purchase Behaviour	PBSH1	0.876	0.916	0.937	0.748
	PBSH2	0.870			
	PBSH3	0.878			
	PBSH4	0.894			
	PBSH5	0.803			
Subjective Norms	SN1	0.685	0.924	0.937	0.683
	SN2	0.841			
	SN3	0.833			
	SN4	0.811			
	SN5	0.910			
	SN6	0.886			
	SN7	0.802			
Social Networks	SNT1	0.870	0.952	0.962	0.806
	SNT2	0.890			
	SNT3	0.906			
	SNT4	0.888			
	SNT5	0.916			
	SNT6	0.917			

Table 4. Discriminant Validity

	Attitude	Behaviour	Cost	Happiness	Intention	PBC	Social Net	Subjective Norms
Attitude	0.878							
Behaviour	0.415	0.865						
Cost	0.512	0.376	0.841					
Happiness	0.434	0.738	0.381	0.843				
Intention	0.376	0.600	0.317	0.688	0.892			
PBC	0.671	0.371	0.704	0.404	0.360	0.817		
Social Net	0.405	0.292	0.665	0.246	0.243	0.647	0.898	
Subjective Norms	0.584	0.332	0.516	0.288	0.259	0.595	0.447	0.827

STRUCTURAL MODEL ANALYSIS

As shown in figure 2, the variance (R^2) in intention to purchase sustainable smart houses is 38.5% which is considered high and the variance (R^2) in community happiness is 54.4% which is also considered quite good. Thus it can be concluded that independent variables used in this study substantially predict dependent variables.

As shown in figure 3,hypotheses between attitude and intention (β = .244, T-statistics = 2.682 > 1.96 and p = .008 < .05), intention and behaviour (β = .555, T-statistics = 8.236 > 1.96 and p =.000 < .05), social network and behaviour (β = .165, T-statistics = 1.998 > 1.96 and p = .046 < .05) and behaviour and happiness (β = .738, T-statistics = 19.222 > 1.96 and p = .000 < .05) were supported. However, hypotheses between cost and intention (β = .110, T-statistics = 1.263 < 1.96 and p = .207 > .05), PBC and intention (β = .129, T-statistics = 1.406 < 1.96 and p = .160 > .05), subjective norms and intention (β = -.017, T-statistics = .188 < 1.96 and p = .851 > .05) and moderating role of social networks between intention and purchase behaviour (β = -.040, T-statistics = .525 < 1.96 and p = .600 > .05) were not supported. Please refer to figure 3 and table 5 for further details.

Figure 3. Structural Model

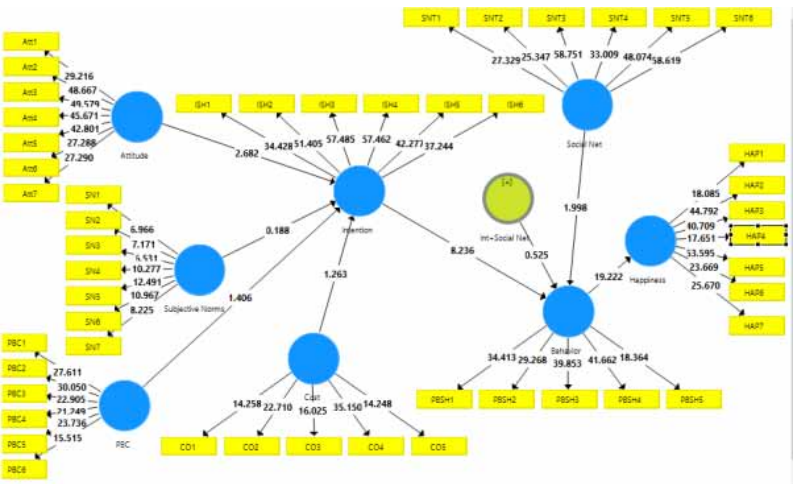


Table 5. Hypotheses Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values	Decision
Attitude -> Intention	0.244	0.238	0.091	2.682	0.008	Supported
Behaviour -> Happiness	0.738	0.739	0.038	19.222	0.000	Supported
Intention -> Behaviour	0.555	0.561	0.067	8.236	0.000	Supported
Cost -> Intention	0.110	0.113	0.087	1.263	0.207	Not Supported
Int+Social Net -> Behaviour	-0.040	-0.032	0.075	0.525	0.600	Not Supported
PBC -> Intention	0.129	0.128	0.092	1.406	0.160	Not Supported
Subjective Norms -> Intention	-0.017	0.003	0.091	0.188	0.851	Not Supported

DISCUSSION

This study hypothesised that attitude, subjective norms and PBC will have a positive effect on the intention to purchase sustainable smart houses (H_1-H_3) while cost will negatively affect the intention to purchase sustainable smart houses (H_4). Based on the findings, only attitude has positively influenced the intention to purchase a sustainable smart house. This indicates that only H_1 is supported while H_2 to H_4 were not supported. The positive significant influence of attitude on the intention to purchase sustainable smart houses is in line with the results from Cheah and Phau (2011), Teng and Wang (2015) and Liu et al., (2018). When it comes to behavioural intention, attitude is the starting point of any behaviour and it is largely depending on the perception towards the positive or negative outcomes of the behaviour. The result from this study implies that respondents have a favourable evaluation on having a sustainable smart house. They believe that having these houses will reduce the environmental impact and offer a healthy lifestyle.

The outcome from this study demonstrates that there is no significant influence of subjective norms on intention to purchase sustainable smart houses. This result is parallel with the finding by Chen (2007). This means that subjective norms such as family members and friends do not motivate the respondents' intention to purchase the sustainable house. Having considered that a sustainable smart house is a new concept, most of respondents' family members and friends might not be alert of the recent development and therefore will not be able to encourage the respondent to purchase such houses. In the same vein, the result of PBC also shows that there is no significant influence on the intention to purchase sustainable smart houses. The result is aligned with the research conducted by Zhang, Chen, Wu, Zhang and Song (2018) whereby PBC is not significant in the intention to purchase green house in China. It suggests that control over the resources will not affect respondent intention to purchase the sustainable smart house. The current unstable political and economic condition in the country are the possible reasons for respondents losing their confidence and intention to purchase a house. This finding further reveals that cost is not a major contribution factor on the intention to purchase sustainable smart houses. The initiative taken by Malaysian government and private organisations in promoting sustainable or eco-friendly products to save the environment is working well to influence the respondent's decision. Regardless of cost, individuals are willing to pay more to buy sustainable products (Cronin et al., 2011; Yadav & Pathak, 2016).

The outcome of the study depicts that intention to purchase the smart house has a significant influence on the actual purchase behaviour. This result is consistent with the result by Zheng, Cheng and Ju (2019). This is mainly due to the existence of awareness of sustainable products among Malaysians. People are aware that the use of such products will lead to a better environment and beneficial for future generations by improving the quality of life and saving energy (Tomaş and Dostoğlu, 2020).

Subsequently, the result of the purchase behaviour on community happiness shows a positive significant relationship (H_7 supported). It indicates that happiness can be achieved by purchasing sustainable smart houses. Sustainable smart houses provide benefit and satisfaction from two perspectives. First, it helps the community to save energy and cause less damage to the environment. Second, it offers smart features' technology for instance automation and digitalisation. The result is in line with a study conducted by Cloutier et al., (2013) where it is reported that those communities which are sustainable are happier than those communities which are not sustainable. Moreover, this study also strengthens the findings of Tomaş and Dostoğlu, (2020) where authors concluded that opportunities and strengths outweigh the threats and weaknesses of smart houses. These houses make the life of humans easier by adding comfort to their life and reducing the cost of living.

This study also examined whether social media networks moderate the relationship between intention to purchase the sustainable smart house and actual purchase behaviour or not. The result indicate social media networks do not act as a moderating role in bridging the relationship between the two variables and therefore H_6 was not supported. This result is contradicting with the result of a study conducted by Husnain, Qureshi, Fatima and Akhtar (2016). The possible reason is due to the limited number of available social media networks that promote sustainable smart houses in Malaysia. People prefer to rely on past purchase experience (Chen, Wang & Xie, 2011) rather than social media.

By focusing on the above findings, it can be emphasised that attitude will influence the intention to purchase the sustainable smart houses and subsequently will lead to actual purchase behaviour. Thereupon, the purchase of sustainable smart houses will contribute to a community's happiness.

CONCLUSION AND LIMITATIONS

Community happiness was examined in this study by analysing the antecedents of sustainable smart house purchase intention and actual purchase behaviours. Authors analysed the relationships between attitude, subjective norms, perceived behavioural control and cost as predictors of intention to purchase sustainable smart houses, then uncovered the impact of intention to purchase on actual behaviour and lastly towards community happiness. Furthermore, social media networks were also analysed to see its moderating role between intention and actual purchase behaviour of sustainable smart houses. This study reported a few interesting results, i.e. subjective norms and PBC did not show any relationship with intention to purchase sustainable smart houses. Similarly, cost which is normally associated as a negative predictor also turned out to be a non-predictor of intention to purchase. Furthermore, no moderating effect of social media networks was reported. As expected, attitude, intention and behaviour do show a positive relationship with their respective variables.

The outcomes of current study can provide insights to policy makers, housing developers and real estate agents to understand the factors that influence the purchase intention of potential/future buyers. Policy makers should provide awareness on sustainability issues to a larger portion of population, e.g. school children, higher education students and working adults, to shape the right attitude towards buying sustainable smart houses by paying attention to disseminate information and knowledge about the positive effect of sustainable smart houses on the sustainability of natural environment. This study indicated that community happiness can be elevated by purchasing sustainable smart houses that help to improve the well-being of the occupants. Housing developers can focus on quality and design of sustainable smart houses to attract more buyers as price is not a consideration of sustainable smart house buyers, even though the price is commonly higher than conventional houses. On theoretical contributions, this study combines key theories associated with social behaviour and exchange.

Ultimately, the current research framework generated reflects a holistic framework for a localized context in an emerging economy that can be applied by future researchers of neighbouring ASEAN countries.

Among the limitations of this study, as entire population information was not available, therefore convenience sampling was used to select respondents which may cause misrepresentation of population. Another limitation of the study is the ethnicity. Majority of the respondents belonged to Malay and Chinese ethnic groups and very less Indian and other smaller ethnic groups participated in the study which results in lack of representation to the entire population in Malaysia.

Due to these limitations, other researchers in future should test the same variables by including all significant ethnic groups of Malaysia to improve generalizability of the results.

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