

A Study of Human Attitude, Persuasion And Ethics Towards The Adoption Of Sustainable Technology Among Malaysian SMEs

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Abstract

This research investigates the impact of human attitudes, human persuasion and human ethics towards the adoption of sustainable technology among the small and medium-sized enterprises (SMEs) in Malaysia. There is a lacuna in the literature of the focusing on the human factors (attitudes, persuasions and ethical belief) of adoption of sustainable technology in the SMEs context in emerging economy such as Malaysia. The study develops a comprehensive model of sustainable technology adoption considering the strengths and limitations of the existing models. The main theories utilized this paper include the theory of reasoned action (TRA), theory of planned behavior (TPB), attribution theory (AT), environmental attitudes model and the triple bottom line model. The theoretical framework developed for this study is based on the premise of the above theories. A total of 234 sample taken from 2369 SMEs in Malaysia. The major finding of this research suggest that affective attitudes, cognitive attitudes, reasoned persuasion, sentimental persuasion, anthropocentrism and altruism significantly impact adoption mechanism of sustainable technology in a Malaysian setting. These findings are later highlighted in this paper. The implications, limitations and future research avenue are highlighted in the paper.

1. Introduction

Developing sustainable technological innovation is more than a goal for the future. It is a survival approach that will inform and ensure the long-term survival of humanity as well as make improvements in humans' daily lifestyles. Research proves that the acquisition of sustainable technology will eventually reduce the possibility of environmental degradation, pollution and climate change (Parrish, 2007; Guerra et al., 2016; Irandoust, 2016; Moon et al., 2016; Fu et al., 2018; Meijeret *al.*,2019).Sustainability is a form of development that meets the needs of the present without compromising the ability of future generations to meet their needs (Berardi, 2013). Despite its prominence, this definition does not provide a clear description from an organizational and technological innovation standpoint. As such, organizations often find it difficult, with their roles and their perspective to produce new technological innovation that contributes to sustainability (Gmelin&Seuring, 2014). Therefore, sustainable technological innovation can be best defined as the innovation that has the potential in reducing long-term risks associated with resource depletion, fluctuations in energy costs, product liabilities, pollution, waste management and treatment (Shrivastava, 1995; Gmelin&Seuring, 2014; Choet *al.*,2019; Adnan et al., 2019).

In today's world, the development and implementation of sustainable technology is not only an unavoidable social and environmental issue; it is also a major challenge for many companies (Goepet *al.*,2014; Xia et al., 2019). Technological innovation implementation should balance both economic progress and natural resource consumption, without endangering the ecosystem (Bohnsacket al., 2014; Ion & Gheorghe, 2014; Xia et al., 2019). Thus, sustainable development and new technological innovation are nowadays recognized as the most important source of economic, social and environmental growth. With the aim of decreasing the cost of usability, many industries are consequently benefiting from this, prompting new technologies that are widely adopted (Maet *al.*,2009; Talukder, 2019). As mentioned by

Carrigan, Moraes and Leek (2011), the question that needs answering is: can SMEs contribute to sustainability? Their core ability and role in fostering societal change towards a more sustainable and environment-friendly mode of living is still being explored.

This research fills a gap in the literature on sustainable technology adoption within SMEs context in a developing country such as Malaysia. The study aims to provide an evaluation of each contributory antecedent created by the technology to assist SMEs to achieve their objectives. Previous research on innovation management focused more on the external factors of the adoption process (i.e. management, government, social and organization factors). Conversely, there is less research focusing on the internal factors (attitudes, persuasions and ethical belief) of adoption (Boonset al., 2013; Brunkeet al.,2014; Longeet al.,2016; Fu et al., 2018; Adnan et al., 2019). Thus, this research focuses on organizational attitudes, persuasions and ethical belief, and their effects on the adoption process of sustainable technology. The key issues surrounding sustainable innovations have expanded, where ethical values and organizations' concerns shift between greater or lesser inclination towards the environmental concern. In order to test organizational attitudes, persuasions and ethical belief, four main theories were executed and expand. The theory of reasoned action (TRA) and theory of planned behavior (TPB) are the theory that best explain attitudes. Attribution theory (AT) will further explain the persuasions, whilst Thompson and Barton's Environmental Attitudes Model (EAM) will explain individuals' belief. All four theories are used and expanded to explain the current phenomenon of organizational attitudes towards sustainable technology.

Sustainable technology is attributed to the deep connection between organizations' beliefs, actions, decisions and practices in their everyday lives. This will allow the expansion of the theoretical model in innovation management, filling in the gap in the current theoretical framework. Fewer studies have considered the possibility of creating opportunities for increased organizational performance through sustainable technology. Furthermore, antecedents to measure the levels of sustainable technology adoption are also scarce. Therefore, this research can elucidate an organization's perceptions of and expectations from the possible outcomes of adopting the sustainable technology. This expectation outcome were derived and expended from the three bottom line model (TBL) that consist of economy (profit), social (people) and environment (planet) (Quazi& Talukder, 2010; Agamuthu& Victor, 2011; Carrigan et al., 2011; Nagalingamet al., 2013; Bohnsacket al.,2014; Bourlakiset al.,2014; Chen & Tung, 2014; Iveroth& Bengtsson, 2014; Bachoket al., 2015; Adnan et al, 2019; Meijeret al.,2019). Hence, the objective of the study is to investigate the impact of human attitudes, human persuasion and human ethical belief impact on the organizational decision to adopt sustainable technology. The study also explains the impact of moderating variables (Organizational size, duration of business and industry sector) on perception and adoption.

1.1.1 Literature review, theory and model

Radical innovation is defined as the foundational creations that serve as the basis of many subsequent technical developments (Datta & Jessup, 2013; Choiet al.,2016). An alternative meaning for the term is

the involvement of product commercialization, based on the significant leaps made in technological development. This generates the potential for entirely new features and improved performance or cost, compared with the existing choices, offering a substantial increase in consumer benefits (Vowles *et al.*, 2011; Chang *et al.*, 2012; Pino *et al.*, 2016). Radical innovation needs to be unique, novel and original to impact on future technology development (Datta & Jessup, 2013; Keupp & Gassmann, 2013).

Radical innovation is essential for any organization or nations' economic growth and prosperity and solving environmental problems (Buschgens *et al.*, 2013; Choi *et al.*, 2016). Research has shown that adopting radical innovation can only bring about a small percentage of success; therefore, organizations tend to not take the risk of implementing it (Buschgens *et al.*, 2013; Talukder, 2014). Corporations that cannot emulate this form of innovation will find it difficult to stay in the market for a longer period of time, despite their need to survive in order to maintain future markets.

This research proposes the adoption of sustainable technology which is categorized as a radical technology because organizations need to change and develop a new set of processes and operations for the creation of products and services. Due to its radical nature, the adoption of sustainable technology is a change that needs the full cooperation of various levels of stakeholders such as employees, management, suppliers, customers and clients. To contribute to sustainability, innovation serves as an important means of implementing new and significantly improved products, processes, marketing methods and organizational methods in business practices, organizational workplaces and external relations (Nagalingam *et al.*, 2013; Klewitz & Hansen, 2014).

One of the main reasons for organizations undertaking sustainable technology approach is to reduce operating costs and minimize the environmental impacts of business process (Mishra *et al.*, 2014). Organizations encounter a major task on supplying sustainable development accordingly to the demand of clients, consumers and the society (Liu *et al.*, 2012). Excelling on social and environmental dimensions may improve business performance, especially in the current social status where the consumers possess greater awareness on their social responsibility (Achabou & Dekhili, 2013). In achieving sustainable technological innovations, there are four main keys of development such as sustainable living, sustainable resource, sustainable process, and sustainable product that need to be taken from both individuals and organizations to ensure the success of sustainable business (Achabou & Dekhili, 2013; Huijts *et al.*, 2014; Gmelin & Seuring, 2014; Xia *et al.*, 2019).

Our study designs an enhanced model of sustainable technology adoption considering the strengths and limitations of the relevant theories existing in the extant literature. Details of the relevant theories are as follows:

1. The theory of reasoned action (TRA), (Fishbein & Ajzen, 1980) posits that attitudes towards behavior are described as an individual's positive or negative feelings (evaluating effect) about performing that behavior. Attitudes are sets of beliefs about a certain object or an act, which may translate into the intention to carry out the act.

2. The theory of planned behavior (TPB), (Ajzen, 1991). This theory is based on the arguments that the assumption made is that people make rational choices by evaluating and weighing the perceived positive and negative expected outcomes, thus focusing on attaining their goals. This theory also proposes that the intention to behave captures the motivation to exert certain behavior, and hence influences the behavior. TPB uses the same construct as TRA, with the additional construct of perceived behavior control, which is considered a component that controls organizations behavior through their 'ethical belief'. The salient points of this theory are an organization's own attitude, subjective norms, perceived behavioral control, intentions and behavior.

3. Attribution theory (AT) (Heider, 1958). The main premise of this theory is that it highlights the importance of both internal and external on organization attitudes. Theory explains that an organization's action is defined by their inner and outer traits. An organization's personality and situation can be attributed to the actions they have taken; actions are taken if the organization has synchronized both their inner and outer attributes. An organization's attitude is the internal factor that influences certain behaviors, while persuasion is the external factor. Theory is used to find the causative factor of a certain incident or action, bringing out in organization's direct or indirect involvement.

4. Environmental attitude model (EAM) (Thompson & Barton, 1994). This theory is based on the arguments that there are two types of ethical attitudes towards the environment: eco-centric and anthropocentric. These ethical attitudes serve as an organization's moral reasoning towards an environmental dilemma, which is perceived as the human relationship with the environment. Organization awareness of environmental values should be the main focus in creating a more sustainable society. This referred to anthropocentrism as the belief in human superiority over the environment. Thompson and Barton (1994) agreed with this notion; they describe organizations who value the environment for the material and physical benefits it provides, and who argue for the benefits of adopting sustainability. The enhanced and comprehensive model includes several modifications that these existing models lack. The human attitudes (affective, cognitive and behavioral) and human persuasion (credibility, persuasion and sentiment) elements are based on TRA, TPB and AT. The third category, human ethical belief (anthropocentrism, eco-centrism and altruism) is explained by Thompson and Barton's (1994) EAM.

The human attitudes reflect that an individual's intention to adopt a new technology is influenced by their personality (attitudes) and surroundings (subjective norms). Attribution theory describes the surrounding that affects an individual's decision as situational (persuasion), whereby the organization's situation will act as the trigger for their intention to adopt new technology. Both attitudes and persuasion are essential in explaining the function of human attitudes towards sustainable technology adoption. Both are integrated into the research to acknowledge the top management opinions of the environmental issues that can influence its adoption of sustainable technology in the SMEs context.

The third category is human ethical belief, derived from Thompson and Barton's (1994) EAM. Researchers who have utilized this model identified ethical belief as an element, as it explains how an organization makes ethical decisions about the environment. It helps explain the individual perception of environmental values, which is why it is considered an essential inclusion for the research model. It will

explain why organizations base their acceptance of sustainable technology on their ethical beliefs concerning the environment.

Organizational demographic characteristics are also added into the model outlined below in Fig. 1 which will be used as a control variable of the research to explain the level of adoption from different organizations. These include the size of the SMEs, duration in the business and the industry sectors.

1.1.2. Hypothesis development and their justification of their selection

Human attitudes

Research reveals that human attitudes have strong impact on the adoption of sustainable technology (Juvan&Dolnicar, 2014; Burcharth *et al.*,2014; Juvan&Dolnicar, 2014; Adnan et al, 2019). Creating organizational awareness toward sustainability affects the decision-making process by triggering emotions, beliefs and actions in the organization (Iverothe& Bengtsson, 2014; Jeonget *al.*,2014). When an organization emphasizes to change the beliefs and emotions of its employees, then the employees will re-evaluate their responsibilities toward the environment and society (Burcharth *et al.*,2014).Emotional state of an individual employee can lead to an attachment, a feeling of respect, responsibility and joy towards the environment. According to Sanchez, Sanchez andHyder (2014), individuals' behaviour plays an essential role as their action determines the outcome of the environment. Social and personal norm have also been found to have a strong impact on individuals' behavior (Hirsh, 2014; Fu et al., 2018). Based on the above deliberations, it would be justified to present the following hypotheses for testing:

H1:Affective attitude has a positive impact on the adoption of sustainable technology.

H2: Cognitive attitude has a positive impact on the adoption of sustainable technology.

H3: Behavioral attitude has a positive impact on the adoption of sustainable technology.

Human persuasion

Extant research suggests that although individuals' attitudes can affect their behavior towards certain things, if given times and effort, most people can be persuaded through many ways (Shrum *et al.*,2012). A study by Matthes, Wonnebergerand Schmuck (2014) shows that emotional and reasoned persuasion can attract different types of individuals about sustainability. Credibility in enforcing values, images and strong impressions towards sustainability also helps to persuade individuals' attitude towards innovation (Salvado *et al.*,2014). Gossling& Buckley (2014) suggested that persuasive communication plays an important role in creating awareness and affecting individuals' moral responsibility towards the environment. Persuasions are meant to influence individuals to accept a certain practice or routine. Through these strategies, one can influence individual's thinking, feeling and action (Higgins & Walker, 2012; Adnan et al., 2019). Therefore, the following hypotheses are worthy testing:

H4: Credibility persuasion has a positive impact on the adoption of sustainable technology.

H5: Sentiment persuasion has a positive impact on the adoption of sustainable technology.

H6: Reasoned persuasion has a positive impact on the adoption of sustainable technology.

Human ethics

Anthropocentrism and Eco-centrism are two different attitudes which individuals' have towards the environment. Anthropocentrism individuals feel that the environment needs to be protected because of its value to improve human quality of life while Eco-centric individuals feel that nature deserves to be protected because of its intrinsic value (Thompson & Barton, 1994). Different types of environmental attitudes may provide different types of approach and appeal. Research suggested that the attitudes showed by present generation lean more towards the anthropocentrism in which individuals value the environment as something that can generate profit and it should be well maintained for a long-term investment (Kopnina, 2014). Individuals that have high awareness towards the climate change and environmental issue are more inclined to have the Eco-centrism attitudes which makes them prefer to preserve the environment (Kontenkamp & Moore, 2001). Every decision that the organizations make will always affect the people around them. On the other hand, the development of altruistic attitude tends to rely on misfits of others. Individuals that acquire this attribute are affected more on their surroundings rather than themselves. Each decision that they made will always be considerate towards the peoples around them; how does they fair; will the decision benefits others, does it bring misfortune to others. These questions will always play in the mind of an altruistic individual (Verdugo et al., 2009; Hirsh, 2014; Moraes&Millani, 2014; Fu et al., 2018). Therefore, the following hypotheses are proposed:

H7: Anthropocentric attitude has a positive impact on the adoption of sustainable technology.

H8: Eco-centrism attitude has a positive impact on the adoption of sustainable technology.

H9: Altruism attitude has a positive impact on the adoption of sustainable technology.

SMEs Demographics

The characteristic of an organization provides a substantial indicator to measure the capability of a certain organization in adopting innovation or a new practice. In terms of sustainability, the capacity of an organization needs to be analyzed whether they have sufficient time, resources or information to make an adoption (Bourlakis et al., 2014). The capability for an organization to survive in the current market can be identified as an important aspect to measure organizational behavior and attitudes (Stamm&Lubinski, 2011). The SMEs size, duration in business and industry sector can determined the capability for the organization to make business decision and strategic development for the environmental sustainability (Eggers et al., 2013). Therefore, the following hypothesis has been proposed:

H10: SMEs' characteristic has a moderating impact on the adoption of sustainable technology.

2. Methods And Statistical Techniques

The study was conducted among the small and medium sized organizations in Malaysia. Data were collected using survey questionnaire. Table 1 shows the construct of measurement and the sources. Survey questionnaires were distributed randomly to 2360 SMEs in Malaysia. The access to Malaysian SMEs was obtained by cooperating with the Association of SMEs in Malaysia. Although 242 questionnaires were received after two reminders, a total of 234 sets of completed questionnaires were used, while 3 respondents opt out in the middle of the participation and the rest 5 survey questionnaires were disqualified as the respondents did not answer the questions appropriately. Partial Least Square Structural Equation Model (PLS-SEM) was used to analyze the data. PLS-SEM can measure multiple construct variables at the same time, allowing the researchers to evaluate multiple theories within one model. As for this research that used 4 basic theories that been expand and modified according sustainable technology literature, using PLS-SEM is essential to gain an accurate measurement of the data collected (Hair et al., 2012; Hairet *al.*,2013; Sarstedt *et al.*,2014; Sarstedt *et al.*,2014). According to Hair, Hult, Ringle and Sarstedt (2013) the minimum sample size required for the analysis is ten times the maximum number of variables used in the research model. The appropriate sample size has been suggested to be a minimum of 15 subjects for each predictor (variables) for a thorough multivariate analysis suggested by Hair, Anderson, Tatham and Black (1998).

Table 1
Construct of measurement and the sources

Affective Attitudes	Sources
I feel proud of supporting sustainable technology for SMEs	Bhanthumnavin&Bhantumnavin, (2014), Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), Matthes, Wonneberger, and Schmuck, (2014)
I feel positive towards sustainable technology for SMEs	
I am happy to accept the changes in SMEs towards sustainability	
I feel glad that sustainable technology has become a trend among SMEs	
Overall, I feel grateful that SMEs want to adopt sustainable technology	
Cognitive Attitudes	
I believe sustainable technology can help improve the environment	Bhanthumnavin&Bhantumnavin, (2014), Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), Lee & Lee, (2014) and Mishra, Akman& Mishra, 2014.
I believe that sustainable technology can increase the country's development	
I believe sustainable technology can reduce pollution	
I believe that SMEs can contribute in reducing environmental issues	
Overall, I believe SMEs need sustainable technology to save the environment	
Behavior al Attitudes	

Affective Attitudes	Sources
<p>I agree with the idea of sustainable technology for SMEs</p> <p>I will attend courses about sustainable technology</p> <p>I want to know more about sustainable technology</p> <p>I always discuss about sustainable technology with my employees</p> <p>Overall, I have developed an interest to adopt sustainable technology</p>	<p>Chen & Chao (2011), Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), Mishra, Akman& Mishra (2014) Rizzuto, Schwarz & schwarz (2014)</p>
Credibility Persuasion	
<p>A well-known sustainable technology is attractive to be adopted</p> <p>Sustainable technology that guaranteed is an important criterion for adoption</p> <p>Professional recommendation is an important criterion for adoption</p> <p>Internationally renowned sustainable technology is suitable for adoption</p> <p>Overall, I'm convinced to adopt sustainable technology</p>	<p>Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), and Sanchez, Sanchez &Hyder 2014.</p>
Sentimental Persuasion	

Affective Attitudes	Sources
<p>Environmental crisis saddens me; hence I will adopt sustainable technology</p> <p>Environmental degradation angers me; I think sustainability is the answer</p> <p>Climate change worries me, and this drives me to adopt sustainability</p> <p>I worry for safety & welfare condition without adoption of sustainability</p> <p>Overall, environmental damage affects my emotions to adopt sustainability</p>	<p>Dulcic, Pavlic&Silic (2012) and Hair, Hult, Ringle, &Sarstedt, (2013).</p>
Anthropocentrism	
<p>SMEs need to respect the environment to survive in the current market</p> <p>Maintaining the environment will attract more customers</p> <p>A sustainable environment can supply sufficient natural resources</p> <p>Sustainable technology needs to be adopted for the survival of all SMEs</p>	<p>Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), Kim, Jang & Kim (2014), and Matthes, Wonneberger and Schmuck, (2014).</p>
Eco-centrism	
<p>I have the responsibility to ensure the environment is protected and sustained</p> <p>I consider myself as a person who is concerned about the environment</p> <p>I'm frustrated when people do not care for the environment</p> <p>Overall, I am obligated to save the environment for its intrinsic value</p>	<p>Hair, Hult, Ringle, &Sarstedt, (2013), Han (2015), Jebarajakirthy& Lobo (2014), Matthes, Wonneberger, and Schmuck (2014)</p>
Altruism	

Affective Attitudes	Sources
<p>I feel obligated to save the environment for everyone's safety</p> <p>I'm ready to adopt sustainable technology for a better future for everyone</p> <p>It's my responsibility to ensure a comfortable environment for my employee</p> <p>Sustainability will help support the survival of other SMEs</p> <p>Overall, I am responsible to adopt sustainability for humankind</p>	<p>Dulcic, Pavlic&Silic (2012), Hair, Hult, Ringle, &Sarstedt, (2013), Vecchio & Annunziata (2015), and Verdugo, Bonnes, Fonllem, Sing, Armenta &Carrus (2009).</p>
Adoption of Sustainable Technology	
<p>Frequency of usage</p> <p>Actual amount of time spent</p> <p>Usage level</p> <p>Number of technologies used</p> <p>Sophistication level of technology used</p>	<p>Kim, Kim & Goh (2011), Quazi& Talukder (2010), Talukder (2011), Talukder (2012), Talukder (2014), and Talukder &Quazi (2011).</p>

To test the reliability of the variables the researchers used PLS-SEM algorithm to show reliability levels by generating a composite reliability introduced by Joreskog (1971). In PLS-SEM, the variables need to have an outer loading exceed 0.50 to be interpreted as important. Any variables that have below 0.50, it was be put under consideration as a strong candidate for removal, unless it can be retain by experts' opinion (Hair et al., 2012; Hairet *al.*,2013; Sarstedt *et al.*,2014). The composite reliability values between 0.70 and 0.90 can be regarded as satisfactory in an advance theoretical research.

The research data were further tested for its convergent validity and discriminant validity. To measures and establish convergent validity on the variables is by their average variance extracted value (AVE). The AVE is equivalent to the communality of a construct. An AVE value of 0.50 or higher indicates that on average the construct explains more than half of the variance of the variables. In contrary, an AVE of less than 0.50 indicates that on average more error remains in the items than the variance explained by the construct. Convergent validity assessment builds on the AVE values as the evaluation criterion. Discriminant validity is the extent to which a variable is truly distinct from other variables by empirical standards. This show that a variable is unique and captures phenomena that are not presented by other variables in the theoretical research model. The Fornell-Larcker criterion is a conservative approach to

assess discriminant validity. This method compares the square root of every AVE values with the latent variable correlations. Thus, the square root of each variable's AVE should be greater than its highest correlation with any other variables. (Hair *et al.*, 2013). Table 2 shows factor loading, reliability, convergent validity and discriminant validity.

Table 2
Factor loading, reliability, convergent and discriminant validity

<i>Variables</i>	<i>Measurements Items</i>	<i>Factor Loadings</i>	<i>Indicator Reliability</i>	<i>Composite Reliability</i>	<i>Convergent Validity (AVE)</i>	<i>Discriminant Validity</i>
Affective attitude	Affective 1	.874	.764	.959	.823	Yes
	Affective 2	.907	.823			
	Affective 3	.911	.830			
	Affective 4	.917	.841			
	Affective 5	.927	.860			
Cognitive attitude	Cognitive 1	.862	.743	.927	.718	Yes
	Cognitive 2	.873	.762			
	Cognitive 3	.863	.745			
	Cognitive 4	.857	.734			
	Cognitive 5	.778	.605			
Behavioral attitude	Behavioral 1	.874	.764	.942	.765	Yes
	Behavioral 2	.890	.792			
	Behavioral 3	.881	.776			
	Behavioral 4	.826	.682			
	Behavioral 5	.900	.810			
Credibility persuasion	Credibility 1	.890	.792	.951	.795	Yes
	Credibility 2	.893	.797			
	Credibility 3	.898	.806			
	Credibility 4	.902	.814			
	Credibility 5	.875	.766			
Sentiment persuasion	Sentiment 1	.828	.686	.941	.760	Yes
	Sentiment 2	.844	.712			
	Sentiment 3	.892	.796			
	Sentiment 4	.893	.797			
	Sentiment 5	.899	.808			
Reasoned	Reasoned 1	.888	.789	.939	.756	Yes

persuasion Variables	Measurements Items	Factor Loadings	Indicator Reliability	Composite Reliability	Convergent Validity (AVE)	Discriminant Validity
	Reasoned 2	.860	.740			
	Reasoned 3	.868	.753			
	Reasoned 4	.858	.736			
	Reasoned 5	.873	.762			
Anthropo- centrism belief	Anthropo 1	.878	.771	.944	.773	Yes
	Anthropo 2	.886	.785			
	Anthropo 3	.895	.801			
	Anthropo 4	.894	.799			
	Anthropo 5	.840	.706			
Eco- centrism belief	Ecocentrism 1	.854	.729	.944	.770	Yes
	Ecocentrism 2	.877	.769			
	Ecocentrism 3	.894	.799			
	Ecocentrism 4	.864	.746			
	Ecocentrism 5	.898	.806			
Altruism belief	Altruism 1	.877	.769	.944	.771	Yes
	Altruism 2	.853	.728			
	Altruism 3	.902	.814			
	Altruism 4	.849	.721			
	Altruism 5	.906	.821			
Adoption	Frequency	.896	.803	.928	.722	Yes
	Duration	.864	.746			
	Usage	.846	.716			
	Types	.873	.762			
	Sophisticated	.764	.583			

To further analyze this data, the researcher used SmartPLS, which can measure the constructs. By using the PLS-SEM algorithm to run a path coefficient model analysis, this research can determine organizational attitudes towards sustainable technology. The researchers evaluated the theoretical

research framework and further determined the coefficient of determination. Furthermore, a blindfolding and predictive relevance was calculated to summarize the results. An important-performance matrix analysis was further concluded the findings and at the end a modelling categorical moderator effects was calculated to determine a demographic effect of adoption of sustainable technology.

3. Data Analysis And Findings

Demographic information

Table 3 summarizes the respondents' demographics, including the type of SMEs, age of businesses, number of employees, annual sales turnover and location of the establishment. Service-oriented SMEs constitute 44.4%, while product-oriented organizations represent 55.6% of the respondents' cohort. This distribution of organizations' type reflects that product-oriented organizations are keener towards sustainable development as they have exposed themselves to sustainable technology more than service-oriented SMEs.

Table 3
Demographic characteristics

Characteristic		Frequency	Percentage (%)
Type of SMEs	Service-oriented	104	44.4
	Product-oriented	130	55.6
Duration in business	More the 20 years	25	10.7
	16 to 20 years	20	8.5
	11 to 15 years	43	18.4
	6 to 10 years	81	34.6
	Less than 5 years	65	27.8
Number of employees	75 to 200 employees	40	17.1
	5 to 75 employees	94	40.2
	Less than 5 employees	100	42.7
Sales revenue	MYR15 million to MYR50 million	38	16.2
	MYR300,000 to MYR15 million	106	45.3
	Less than MYR300,000	90	38.5
TOTAL		234	100

A total of 25 SMEs (10.7%) that took part in this survey have been established for more than 20 years, while 8.5% has been operational for 16 to 20 years. A 18.4% of the SMEs have run the business for 11 to 15 years and another 34.6% for a period of 6 to 10 years. The rest 27.8% represents a group of newcomers in the business world where they have only started their business less than 5 years. With the data provided in Table 1, the SMEs that took part in this survey mostly came from organizations that have less than 5 employees, which consist of 42.7% while 40.2% came from organizations that have 5 to 75 employees. For a medium size organization, a total of 17.1% has taken part in this survey. Although most of the SMEs that took part in this survey are from the small-scale organizations, the highest percentage for the sales turnover are between MYR300,000 to MYR15 million which consists of 45.3%, while the second highest is the organizations that accumulated less than MYR300,000 a year that is made of 38.5%. The organizations that gain sales turnover between MYR15 million to MYR50 million that is a total of 16.2% in this survey. This data has shown two important aspects. The first aspect is that the SMEs that have taken part in this survey have reflected the current status of SMEs in Malaysia, with micro-organizations as the highest number of organizations Malaysia, followed by small scale organizations and medium size organizations. The second aspect is that the micro and small organization lean more aware of sustainable development and are willing to take part in sustainable adoption studies.

Composite reliability

Internal consistency reliability that is also known as composite reliability is the modern version of Cronbach' Alpha which provides an estimate the reliability based on the inter-correlations of the observed indicator variables. According to Nunally and Bernstein (1994) composite reliability values from 0.60 to 0.70 are acceptable in exploratory research while in more advance research, values between 0.70 and 0.90 can be regarded as satisfactory. As shown in Table 2, it indicates that the composite reliability values of 0.959 (Affective), 0.927 (Cognitive), and 0.942 (Behavioral), demonstrated that all three organizational attitudes variables have high levels of internal consistency reliability. The same results can be seen in Table 2 for organizational persuasion, which shows high level of composite reliability values of 0.951 (Credibility), 0.941 (Sentiment), and 0.939 (Reasoned). In Table 2, the values for organizational ethical belief and adoption variables also show high internal consistency reliability values of 0.944 (Anthropocentrism), 0.944 (Eco-centrism), 0.944 (Altruism), and 0.928 (Adoption).

Convergent validity

To measure and establish convergent validity of the variables, the researcher used average variance extracted value (AVE). The AVE values of affective (0.823), cognitive (0.718), behavioral (0.765), credibility (0.795), sentiment (0.760), reasoned (0.756), anthropocentrism (0.773), eco-centrism (0.770), altruism (0.771), adoption of sustainable technology (0.722) are well above the required minimum level of 0.50. Thus, the independent and dependent variables of the theoretical research model have high levels of convergent validity.

Discriminant validity

As indicated in Table 2, the results of Fornell-Larcker criterion assessment with the square root of the AVE are assembled diagonally. The value was compared to all the correlation values of each column. Table 4 shows that the square root of all variables is greater than the highest values of other correlation which indicates that all variables are discriminately valid.

Table 4
Summary of quality assessment

Variables	Composite Reliability	Convergent Validity	Discriminant Validity
Affective attitude	.959	.823	Yes(0.907 > 0.425)
Cognitive attitude	.927	.718	Yes(0.847 > 0.663)
Behavioral attitude	.942	.765	Yes(0.875 > 0.743)
Credibility persuasion	.951	.795	Yes(0.892 > 0.663)
Sentiment persuasion	.941	.760	Yes(0.872 > 0.707)
Reasoned persuasion	.939	.756	Yes(0.870 > 0.646)
Anthropocentrism belief	.944	.773	Yes(0.879 > 0.595)
Eco-centrism belief	.944	.770	Yes(0.878 > 0.733)
Altruism belief	.944	.771	Yes(0.878 > 0.514)
Sustainable technology	.928	.722	Yes(0.850 > 0.501)

Structural model

By running the PLS-SEM analysis, estimates are obtained for the structural model relationships which represent the hypothesized relationships among the variables. The path coefficients have standardized values between - 1 and + 1. The path coefficient that shows significant and positive value are affective (0.341), altruism (0.295) and reasoned (-0.105). Other path coefficient values are cognitive (-0.016), behavioral (0.080), credibility (0.057), sentiment (0.033), anthropocentrism (0.018), and eco-centrism (-0.058).

Although the path coefficient can estimate the significant values of a variable, ultimately it depends on its standard error that is obtained by means of bootstrapping. In bootstrapping, subsamples are randomly drawn from the original set of data. Each subsample is then used to estimate the model. This process is repeated until a large number of random subsamples have been created. In this research, the total of subsamples is 10,000 to represent SMEs in Malaysia. The bootstrapping will be applied to compute the *t* value. The empirical *t* value needs to be larger than the critical value, to determine whether the coefficient is significant at a certain error probability. After computing the *t* values, any value that is more than 1.65

(significant level = 10%) will be considered as significant. The PLS path show that the relationship between affective attitude towards adoption is very significant at t value of 7.205 (> 1.65). The relationship between cognitive and behavioral attitudes shows non-significant relationship towards adoption of sustainable technology where the t value is 0.223 (< 1.65), and 1.223 (< 1.65). Even the persuasion variables show a non-significant relationship towards the adoption as the t value for credibility is 0.708 (< 1.65), while sentiment has a t value of 0.369 (< 1.65) and reasoned is 1.171 (< 1.65). In terms of ethical belief, only altruism belief has a strong significant value towards the adoption at t value of 3.440 (> 1.65), while anthropocentrism and eco-centrism have a non-significant relationship at t values of 0.233 (< 1.65), and 0.692 (< 1.65).

This study also reports the p values that correspond to the probability of erroneously rejecting the null hypothesis. To determine the p values as a significance value, the value needs to be described as significance when $p < 0.001$, $p < 0.05$, and $p < 0.10$. Anything that is higher than 0.10 is considered as non-significant. The variables that show very significance values ($p < 0.001$) is affective and altruism.

The most commonly used measure to evaluate the structural model is the coefficient of determination. The coefficient of determination (R^2 value) ranged from 0 to 1, with higher levels indicating higher levels of predictive accuracy. In the research of organizational attitudes, R^2 value of 0.20 and above are considered as high predictive accuracy. In this research, R^2 value of 0.26, 0.13, or 0.02 for dependent variable can be respectively described as substantial, moderate, or weak (Cohen, 1988; Henseler et al., 2009; Hair et al., 2011; Wong et al., 2016). The coefficient of determination (R^2 value) for adoption shows a substantial value of 0.262. The change in the R^2 value when a specified independent variable is omitted from the model can be used to evaluate whether the variables have substantive impact on the dependent variables. This measure is referred to as the f^2 effect size. Assessing the f^2 are that values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects of the independent variables (Cohen 1988). Indicated in Table 5, the f^2 effect size for all the relationship between independent and dependent variables are listed. The relationships that have weak effect size are cognitive \rightarrow adoption (0.000), behavioral \rightarrow adoption (0.003), credibility \rightarrow adoption (0.002), sentiment \rightarrow adoption (0.001), reasoned \rightarrow adoption (0.004), anthropocentrism \rightarrow adoption (0.000), and eco-centrism \rightarrow adoption (0.002). The relationship that has a small f^2 effect size is altruism \rightarrow adoption (0.037), and there is only one relationship that considered having medium f^2 effect size, which is affective \rightarrow adoption (0.121).

Table 5
Summary of results

	Path Coefficients	f^2 Effect Size	q^2 Effect Size
Affective → Adoption	.341	.121	.079
Cognitive → Adoption	-.016	.000	-.001
Behavioral → Adoption	.080	.003	.001
Credibility → Adoption	.057	.002	-.001
Sentiment → Adoption	.033	.001	-.001
Reasoned → Adoption	-.105	.004	.001
Anthropocentrism → Adoption	.018	.000	.000
Eco-centrism → Adoption	-.058	.002	.001
Altruism → Adoption	.295	.037	.022

In addition to evaluating the magnitude of the R^2 values as a criterion of predictive accuracy, this study also determines the Q^2 value. This measure is an indicator of the theoretical research model's predictive relevance. It will accurately predict the data points of the construct measurements of each independent and dependent variable. The Q^2 value for adoption variables carry the value of 0.169, which indicates that the dependable variable has predictive relevance (Hair *et al.*, 2013; Wong *et al.*, 2016). Like the f^2 effect size approach for assessing R^2 values, the relative impact of predictive relevance can be compared by means of the measure to the q^2 effect size. As indicated in Table 4, the q^2 effect size that is considered as weak are cognitive → adoption (-0.001), behavioral → adoption (0.001), credibility → adoption (-0.001), sentiment → adoption (-0.001), reasoned → adoption (0.001), anthropocentrism → adoption (0.000), and eco-centrism → adoption (0.001). The small q^2 effect size that are shown in the table are affective → adoption (0.079), altruism → adoption (0.022).

To take a step further in analyzing the data, importance-performance matrix analysis (IPMA) extend the results of PLS-SEM by also taking the performance of each variables into account. With the result, the research can make a conclusion on two dimensions which are particularly important to prioritize further actions. It is preferable to primarily focus on improving the low performance of constructs with larger importance regarding their explanation of a certain target variables. Importance-performance matrix analysis (IPMA) can explain the structural model total effects (importance) and the average values of the latent variable scores (performance) to highlight significant areas for the improvement in the future activities. As shown in Table 6, the affective variable has high importance of 0.279 with the performance of 69.970, while cognitive variable has a negative importance of -0.017 with the performance of 72.820. Behavioral variable also has a low importance of 0.076 with a moderate performance of 66.983, and credibility variable share the same fate with a low importance of 0.057 with a performance level of

67.804. Sentiment variable has a 0.033 level of importance with 64.690 performances, followed by reasoned variable that has a negative importance level of -0.105 with a performance level of 68.268. For the ethical belief, only altruism that has a high importance level of 0.312 that has a performance level of 76.305, while anthropocentrism and eco-centrism have a low importance level of 0.018 and - 0.058. Table 7 shows support status of hypotheses testing.

Table 6
Index value and total effect (adoption as dependable variable)

	Importance (Total Effects)	Performance (Index Values)
Affective	.279	69.970
Cognitive	- .017	72.820
Behavioral	.076	66.983
Credibility	.057	67.804
Sentiment	.033	64.690
Reasoned	- .105	68.268
Anthropocentrism	.018	67.197
Eco-Centrism	- .058	70.146
Altruism	.312	76.305

Table 7
showing the support status of hypothesis testing

Hypothesis	Support status
<i>H1: Affective attitude has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H2: Cognitive attitude has a positive impact on the adoption of sustainable technology.</i>	
<i>H3: Behavioral attitude has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H4: Credibility persuasion has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H5: Sentiment persuasion has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H6: Reasoned persuasion has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H7: Anthropocentric attitude has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H8: Eco-centrism attitude has a positive impact on the adoption of sustainable technology.</i>	Supported
<i>H9: Altruism attitude has a positive impact on the adoption of sustainable technology.</i>	Supported

4. Discussion And Implications

The results from the PLS-SEM path analysis in general show that affective attitudes and altruism belief to be positive and significant towards the adoption of sustainable technology (Fig. 2). This shows that the stronger organizations have positive feelings towards sustainability, there are possibilities for the organization to adopt sustainable technology. Furthermore, the research shows that Malaysian SMEs have high altruism values which put others well-being before their own. The more their actions affect the people around them, the more they will eventually lead them to adopt sustainability. As shown in Table 4, the R^2 value for adoption as dependent variables is high at 0.233. The variable that has contributed the most to explain the adoption is the affective attitude of with predictive accuracy (f^2 effect size) value of 0.121 and predictive relevance (q^2 Effect Size) of 0.079. This show that affective attitude is the main factors for organizations to adopt sustainable technology which support our first hypothesis (H1). As Buijsand Lawrence (2013) stated, these emotional states can drove individuals' and even organizations' towards deciding to approach sustainable technology with a feeling of attachment, respect, responsibility, and joy towards sustainable technological innovation. An affective attitude involves directly within individuals' action towards a certain phenomenon. Their emotional state will create reactions when encountering a problem or an opportunity, thus lead towards an action of a certain phenomenon. This

shows that with high affective attitudes individuals' that deciding for their organizations, can lead towards the adopting sustainable technology. Sustainable technology within a developing country carries a lot of burden for SMEs where a lot of financial stress change for an opportunity into a liability. Organizations need to have high affective attitude to ensure that they will take the opportunity although it may carry some risk for their organizations. The stronger their affective attitudes, the more willing for them to make the sustainable technology a success or their organizations. According to Jepson, Brannstrom and Persons (2012), organizations tend to adopt a new opportunity if it can create and help the organizations to gain more benefits in increasing their profit gain. In term of sustainable technology, the opposite effects occur where the well-being of the people around them have been put as the first priority. The results of this research agree with Verdugo, Bonnes, Fonllem, Sing, Armenta and Carrus (2009) and Hirsh (2014), where altruistic attitude of selflessness can always open to change, which have an impact among individuals and organizations that care for the others. This data has shown a supportive result on this research ninth hypothesis (H9). The usage of dangerous material and resources that will affects other individuals' health and safety have lead organizations to change their approach into sustainability.

Continuing in this discussion, this study further explains the phenomenon when there is a moderator that is involved among the PLS-SEM path coefficients. Although Fig. 2 has explained the path relationship in general, in case of a moderator effects, there will be a different phenomenon that really needs to be further discussed before any conclusion can be made. As shown in Figs. 3 and 4, there are multiple antecedents that need to be added into the theoretical research model to explain clearly the phenomenon for the service-oriented and micro sized organizations. In the services industry for SMEs in Malaysia, cognitive attitudes, reasoned persuasion and anthropocentrism belief also play great roles in the adoption of sustainable technology. The service-oriented organizations have high cognitive attitudes towards the adoption process, which show that they believe in their responsibility towards achieving sustainable businesses. Lee and Lee (2014) describe cognitive attitude as strong belief that will drive organizations to act to ensure sustainability is achieved. According to Mishra, Akman and Mishra (2014), organizations that have strong belief towards sustainability are more driven towards the benefits that this technology possesses. This can be explained looking at the characteristic of service-oriented organizations.

As services-oriented organizations tend to focus on the benefits of the adoptions, they tend to have higher anthropocentrism belief and are easily persuaded by reasoning. High anthropocentrism belief shows that the services-oriented organizations tend to adopt sustainable technology to create appearance in front of the clients and customers as an attraction. All the benefits that can be gained from the adoption can be obtained as personal interest. A total reasoning can persuade the service-oriented organizations by providing facts and accurate data that inform them regarding the benefits of sustainable technology. Approaching and encouraging organizations through this method can be done in a form of arguments, giving logic and facts, revealing data and evidence that can give organizations a reason or motivate them to adopt sustainable technology.

As described by Han (2015), organizations that are attracted to sustainable technology through reasoned are mostly made of individuals that have high cognitive attitudes towards that technology, which can bring them benefits or in other words it is known as anthropocentrism. This description accurately explains the phenomenon for the services-oriented organizations. In terms of product-oriented organizations, the path coefficients are similar with the general theoretical research model.

In terms of the size of organizations among the SMEs in Malaysia, there are different perceptions for micro organizations. Micro organizations in Malaysia are described as organizations that have less than 5 employees and gain sales turnover that is lower than MYR300,000. Micro organizations in Malaysia tend to have an eco-centrism belief, which means they value the nature and environment for its own intrinsic beauty. The organizations can be easily appealed through emotional persuasion that portrays the important of conserving the environment. They lean more towards pro-environmental, which focuses on enhancement and preservation. These organizations tend to have a vision to survive for a longer period in the future, which need a long run process. Such process describes the micro organizations as those which have a plan and sustainable technology that carries the role to help them survive the current market and the future.

As Morgan, Hine, Bhullar and Loi (2015) describe the characteristic of an eco-centric organizations, is that they are responsive to sentiment persuasion as indicated in Fig. 3. There is only one additional factor that needs to be explained in relation to the size of SMEs in Malaysia, where Medium organizations tend to have lower affective attitudes. The values still point to a positive relationship, but they describe medium organizations as not able to easily adopt sustainable technology through their affective attitudes. All these results show that our hypothesis on demographic (H10) has shown us that a certain criterion of SMEs requires a certain kind of attention to ensure a smooth adoption of sustainable technology. The government and NGOs must apply a certain strategy to provide directions to a certain group of SMEs.

Implications for SMEs

In adopting sustainable technology, affective attitudes and altruism are the essential elements towards the completion of the process. It is important for SMEs to acknowledge that their feelings and opinions play an important role in the decision to adopt sustainable technology. Risking the adoption of sustainable technology that they do not favor; attractive sustainable technology should be focused on instead. As the affective attitude increases, the adoption of the technology by SMEs will occur more effectively. If they did not favor or feels uneasy when using the technology, eventually they will give up half way; this is a waste of both effort and time. SMEs also should choose sustainable technology that will reduce any risk faced by both their employees and customers. Higher altruism will encourage the employees to put in extra efforts and ensure that the adoption is a success.

All practicing organizations can create awareness campaigns that highlight the enjoyable, easy and exciting ways to use sustainable technology, triggering the interest for its adoption. Furthermore, comprehension of organizational role and possible changes that can be made for people around SMEs may trigger their altruism belief, encouraging for the acceptance of sustainability. Promoting sustainable

technology in a way that can affect emotions and the sense of responsibility can be executed by multiple ways: campaigns, advertisements, charity events, and communication skills its beneficial outcome.

By exhibiting the benefits that can be achieved from adopting sustainable technology, organizational interest can be increased. Through the findings, SMEs in Malaysia apparently have the interest in adopting sustainable technology. Malaysian SMEs are willing to use the technology and try it if given the opportunity and reason to do so. This shows that efforts to promote sustainable technology will not go to waste. The government and NGOs cooperate in can encouraging organizations to be more sustainable for the sake of a more secure future for the next generations. The results serve as a guide on designing communication strategies that can diffuse sustainable technology successfully.

Implication for theoretical advancement

The research has succeeded in filling the gap in the current studies of the area by describing the current phenomenon regarding SMEs perception towards the adoption of sustainable technology. The study broadens the knowledge on the role and extent of sustainable technology adoption as it impacts on Malaysian SMEs. Through expanding the current existing theories (i.e. TRA, TPB, AT & EAM), this research has managed to prove and provide an extension of current theoretical foundation in the field of adoption studies. The proposed new variables were able to contribute to the advancement of the research field, giving new possibilities for developing new research. By explaining the current attitudes (i.e. attitudes, persuasion & ethical belief) towards the sustainable technology adoption process, it has proved that attitudes by itself does not explain thoroughly regarding individuals' perception. Through dividing and expanding the attitude variables, the research was able to explain the important role played by each variable towards the adoption of sustainable technology. Thus, through the theoretical advancement, this research has fulfilled its role by providing new theoretical contribution in the current research field.

5. Implications For Society

The findings of this research have important implications for society. First, society will be better off in terms of benefits arising from implementation of sustainable technology in organizations. Use of sustainable technology will contribute to lower emission in the atmosphere and thereby make pollution management easier. Use of sustainable technology will also have critical bearing on health and safety of citizens as well as on employees. Furthermore, implementation of sustainable technology will result in enhancement of efficiency and effectiveness of business operations leading to higher profits. Societal benefits from better business performance will result in terms of employment opportunity leading to increased purchasing power and higher standard of living of citizens.

6. Conclusion

By identifying a comprehensive list of organizational attitudes, persuasions and ethical belief factors as well as demographic in organizations' perception towards the adoption of sustainable technology, this

study departs from the traditional sustainable acceptance model that factors affecting such adoption is not limited to a few factors. Thus, this study contributes to knowledge by introducing a number of diverse factors impacting organizational adoption of sustainable technology in a transitional economy such as Malaysia. The PLS-SEM path analysis indicated that twelve independent variables impact adoption of sustainable technology. These twelve factors accounted for 72.2% of variance in the organizational acceptance of sustainable technology.

The results of PLS-SEM path analysis indicated that affective attitudes and altruism have high coefficient and predictive ability towards the adoption of sustainable technology. Thus, it is suggested that the government, private organizations and NGOs which aim to implement sustainability among SMEs need to focus on creating a surrounding environment based on these approaches. Demographic characteristics do show definite differences for the advanced theoretical research model used in this research findings further suggest that service-oriented organizations and micro organizations need to integrate the changing circumstances resulting from emergence of additional factors impacting adoption of sustainable technology. More specifically, our research found that service-oriented organizations are affected by affective attitudes along with cognitive attitudes, reasoned persuasions and anthropocentrism as depicted in in Fig. 3. This study also found that micro sized organizations are affected by sentimental persuasion. These organizations also have eco-centrism belief as part of their ethical belief.

The research outcomes also suggest that government, private organizations and NGOs need to design appropriate strategies based on their target audiences. The government or NGOs need to implement additional methods to tackle services-oriented organizations and micro sized organizations to ensure a smooth adoption process of sustainable technology. This is important, where different approach may prove to be useful for a certain group of organizations. Towards implementing and managing sustainability government organizations and NGOs must recognize the organizational attitudes, persuasions and ethical belief as well as demographic factors as critical imperatives influencing organizational adoption of sustainable technology. The findings of this study will help governments to identify factors and provide favorable environmental conditions prior to implementation of sustainable technology. Finally, our study offers better understanding of the critical factors promoting adoption of sustainable technology in a transitional market economy such as Malaysia.

7. Limitations And Future Research Potential

The obvious limitation of the study lies in data sourced from a single country which limits the scope for generalization of the findings. Towards overcoming this limitation, future research can broaden the data base sourced from a number of transitional economies such as China, Indonesia and Brazil. Furthermore, this study used PLS-SEM technique to analyses data which has its inherent limitations inter alia overseeing actual correlations. Towards overcoming the limited boundaries of this soft modelling technique, future research can use more robust statistical technique such as SEM which ensures model fit. Also, a comparative study of the drivers of adoption of sustainable technology in transitional and

advanced economies would broaden our understanding of the complexities associated with adoption of sustainable technology in diverse economies.

Declarations

Availability of data and materials

All data generated or analyzed during this study are confidential.

Competing interests

The authors declare they have no competing interests.

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Authors' contributions

All the authors divided the research work and contributed towards this research paper in excellent team spirit. Moreover, read and approved the final manuscript.

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Figures

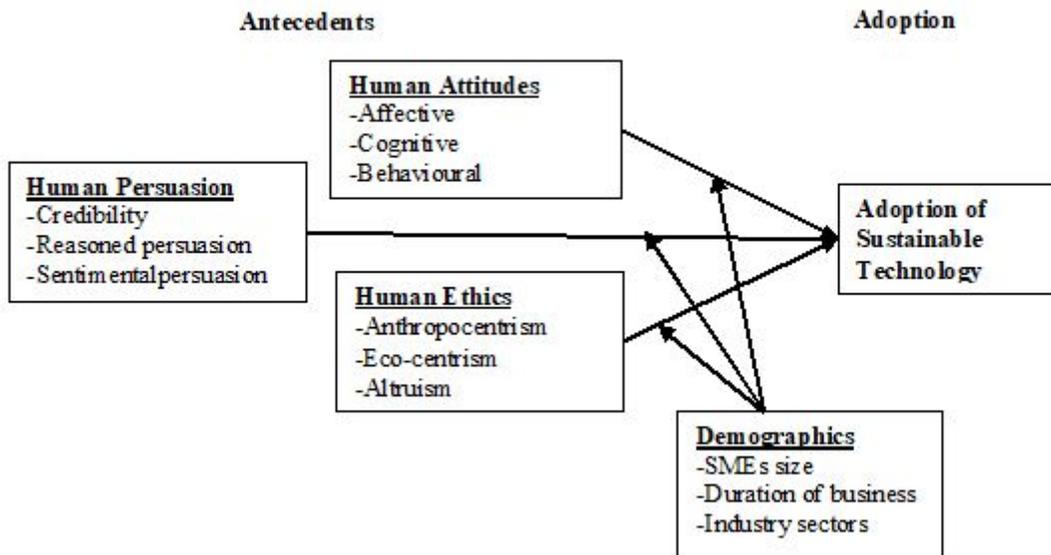


Figure 1

Theoretical research framework

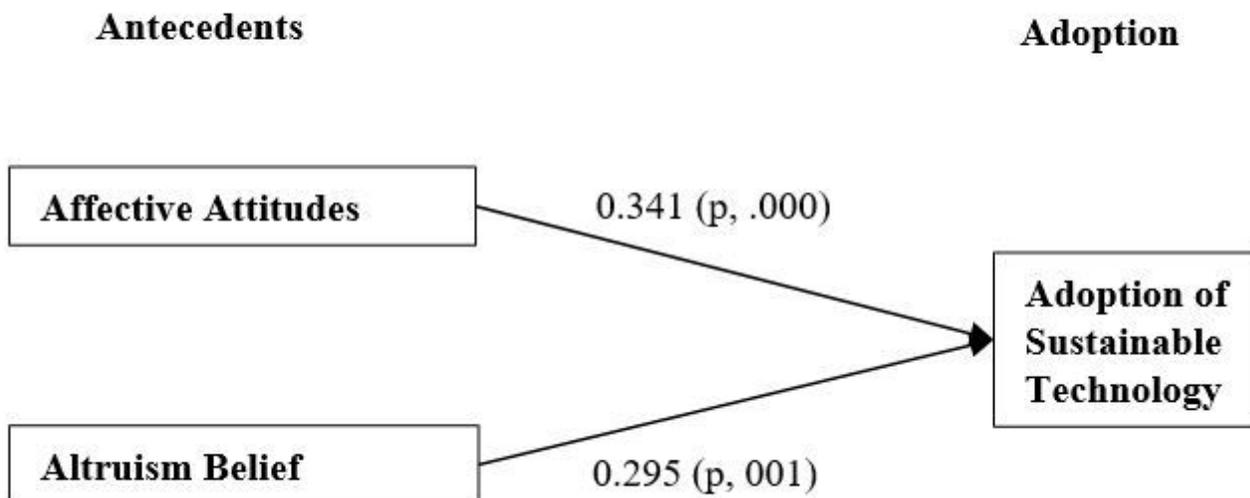


Figure 2

PLS-SEM Path theoretical research model

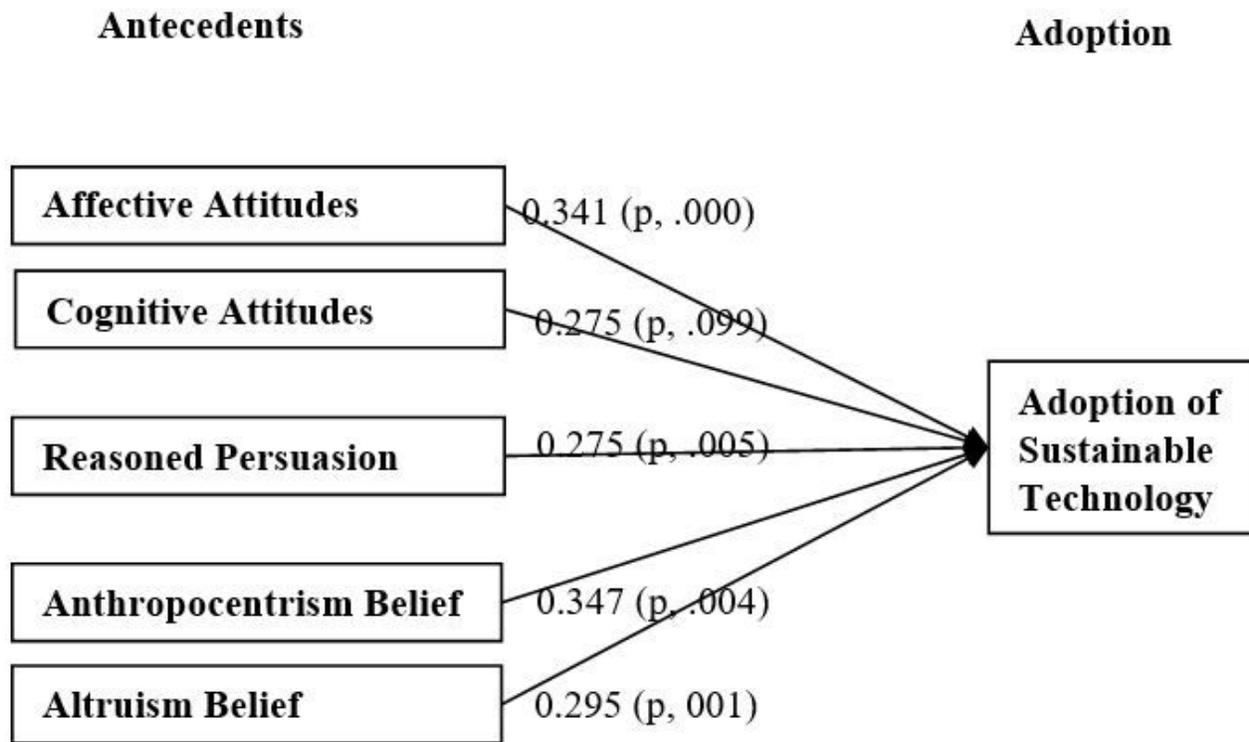


Figure 3

PLS-SEM Path theoretical research model (service-oriented organizations)

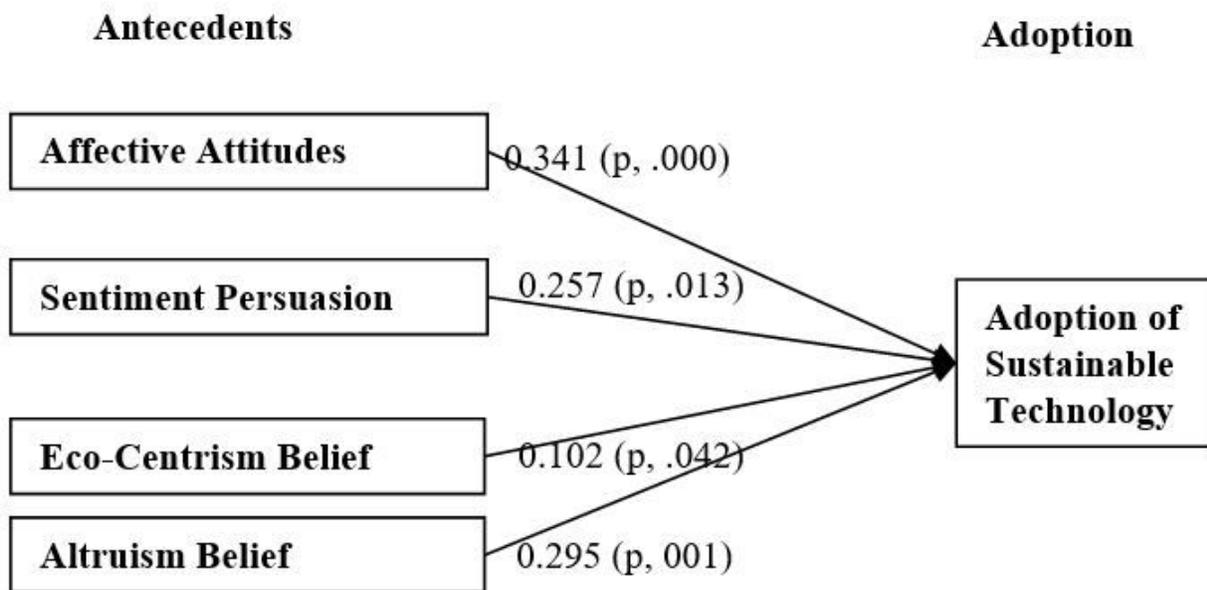


Figure 4

