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The Intention to Adopt Green IT Products in Pakistan: Driven by the Modified Theory of Consumption Values

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Abstract: Over the last decades, prompt economic growth and the resulting overconsumption has deteriorated the environment in an accelerated way. This environmental deterioration has prompted academicians and practitioners to study ecological consumption behavior. E-waste and energy consumption play a major part in this environmental deterioration, which makes consumer conscious regarding their consumption pattern. In this regard, the emergence of green Information Technology (IT) enables individuals to become involved in environmental protection and sustainability programs to reduce the negative impact of IT products on the environment. This study aims to investigate individual intentions to adopt green IT products in Pakistan by the theoretical foundation of the theory of consumption values (functional value, social value, epistemic value, emotional value, and conditional value). Whereas, an additional value, i.e., the religious value, is included in the model, due to its significant impact in green consumption behavior of individuals. Cross-sectional data is used to obtain a total of 536 valid questionnaires to test the hypothesis. The Partial Least Square Modeling approach is used to test the proposed model (variance-based SEM). The results infer that functional value, social value, epistemic value, emotional value, conditional value, and religious value have significant positive impact on the consumer intention to adopt green IT products. The reasons for the results and implications for the practitioners are discussed. Furthermore, directions for future research have also been suggested.

Keywords: Pakistan; e-waste; green IT; religious value; theory of consumption values

1. Introduction

Environment sustainability and protection have become an extensively debated issue around the world, not only for the organizations, but also for the consumers [1,2]. Understanding green consumption is a growing field of interest for academicians and practitioners, because it has an adverse effect on human health [3,4]. In consumption decisions, considering the physical environmental issues (e.g., air pollution, water pollution, ozone layer depletion, waste disposal, irresponsible use of non-renewable resources) is increasingly important for the quality of life of the future generations [5,6]. Environment sustainability has changed consumer preferences towards different products [7]. As in recent years, Information Technology (IT) has changed the way of interaction with each other and how mankind interacts with the environment [8], because IT worked in both ways i.e., enabler and barrier

in the sustainable development programs [9]. That is why the relationship between environment and IT is complex due to its first and second order negative impact on the environment [10].

The first order negative impact arises from the production, use, and disposal of hardware of the IT products by creating electrical/electronic waste (e-waste). According to the Global e-waste Monitor report [11], the total e-waste globally generated in 2016 was 44.7 million metric tons (Mt), in which Oceania is producing 0.7 million Mt, Africa 2.2 million Mt, Americas 11.2 million Mt, Europe 12.3 million Mt, and Asia having the highest 18.2 million Mt. This generation of e-waste was considered to be 55.4 million Mt by 2021, with annual growth of 3% to 4%. Moreover, second-order negative impact involves the effect of IT on industry and households, like a high volume of energy consumption, which ultimately affects the environment [12]. According to global energy report 2017 [13], global energy demand increased by 2.1% in 2017 and more than doubled as compared to the previous year, which was 0.9% in 2016. Furthermore, it is also expected to grow by 25% until 2040, requiring more than $2 trillion investment every year for energy supply. The adoption of green IT can overcome these first and second order negative impacts [14].

Green IT is the study and practice of designing, manufacturing, using, and disposing of IT products efficiently and effectively with minimal or no impact on the environment [15]. Green IT is now becoming organization standards, due to its effectiveness [16]. As the adoption of green IT as a sustainable practice creates a win-win situation for stakeholders of the organizations [17]. Therefore, green IT is considered to be the nascent research area [18]. Green IT is also considered to be a great interest for developing countries, as it provides opportunities for the economic, social, and environmental benefit for countries suffering from the first-order effect and second-order effect. [2]. In the past, numerous researchers have studied green buying behavior among different product categories, such as green food [19], green sportswear [20], green wine packing [21], green apparel [22], green vehicle [23], and green skin care products [24]. Expectedly, very little research has been specifically concerned with buying behavior of green IT products.

In today's business world, green consumption is a major trend, but this trend is in nascent stages in developing countries, like Pakistan [25]. It is forecasted that e-waste that is generated by the developing counties will twice than developed countries by 2030 [26]. Being a developing country, Pakistan is suffering from the emerging issue of e-waste, as Pakistan has generated 317 kilos Mt e-waste in 2015 [27]. Pakistan has been considered to be one of the major importers of electronic and electrical products and it has become the leading e-waste disposal destination [28,29]. Due to the growth in GDP and high spending on electronic and electric products by households, organizations, and the industry sector, Pakistan is suffering by e-waste i.e., the first order effect of IT products.

Pakistan is not only suffering from the first order effect of IT products, but also there is a second order effect of IT products as energy demand has been an issue of Pakistan for the last two decades. Pakistan has faced a worse load shedding condition in 2011–2013 [30]. There is still a 3000MW power shortfall in Pakistan by 2018, despite government effective initiatives towards energy generations [31]. In total consumption, the household sector has the highest consumption of 51%, followed by industry 26%, agriculture 10%, and commercial 8% of total consumption by 2018 [32]. Accordingly, there is a need to reduce consumptions of different sectors in parallel with the growth of generation capacity of the electricity by different resources to reduce the power shortfall. Furthermore, Bose & Luo [33] has suggested that green IT helps individuals in the reduction of energy consumption. In that way, green IT adoption of individuals can save the energy demand of different energy consumption sectors of Pakistan. The first and second order impact of IT products makes it important to find the individual intentions towards green IT adoption in Pakistan. Moreover, current research on green IT adoption—such as [34–38]—is mostly from developed countries. Additionally, Tushi et al. [18] reveal that most of the studies are conducted in developed countries and researchers ignore developing countries. Therefore, this study is taking the perspective of a developing country, i.e., Pakistan, to find the individual intentions toward green IT adoption.

Individual intention to buy a product refers to consumer's need for product or attitude towards buying or consuming the product. These intentions lead towards action (purchase) of a product and the theory of planned behavior (TPB) and the theory of reason action (TRA) extensively measure them. Despite the generally accepted theories, there are some limitations to these theories in explaining the consumers buying behaviors [39]. Additionally, it is noted by Solaiman et al. [40] that the value factor is not being widely examined. especially consumption values are less studied by researchers in green purchase behavior. Therefore, this study uses the theory of consumption value (TCV) to understand green IT adoption. TCV, as presented by Sheth et al. [41], explains the consumer buying behavior of products by using five different values (functional, social, epistemic, emotional, and conditional). Individuals vary in their consumption behavior, as consumers who use green products have different motives [42]. Moreover, many studies extended the TCV in green consumption behavior by involving different additional values, such as environmental value [43–47], psychological value [44], health value [45], and corporate image value [40], but researchers ignore the religious value in green consumption behavior. Recent studies suggest that religious value is an important influencer in green consumption behavior [48–53], because religion is the most important factor that shapes the values and principles of an individual [54]. Consumer behavior and environmental behavior are influenced by the differences in background, ethical beliefs, and most specifically religious values of individuals [53]. Hence, this study will provide a new theoretical framework in the context of green IT by extending TCV through religious value.

Theoretical Background and Hypothesis Development

Green IT Adoption

Green IT refers to environmentally sound IT. "It's the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems efficiently and effectively with minimal or no impact on the environment" [55]. Today's global business environment has increased the use of IT products and it tends to grow in the future due to the invention of new technologies, like mobile phones, social media, and cloud computing [16]. This growth prompts the positive and negative impact of IT in the organization. The positive impact refers to the making green practices by using environment-friendly resources and reducing paperwork, but at the same time, the negative impact here is in the case of IT related emission, e-waste, and energy consumption [35]. This e-waste is increasing globally, due to imports, advancement in IT, and growth in consumption power of consumers [56]. It is also suggested that the energy consumption of IT products has a negative impact on power supply-demand and the generation of energy [14]. It is argued by Melville [15] that environmental impact of IT is creating pressure on IT users to "go green". To do so, organizational policies should include the green IT perspective, while designing their aims, goals, and plan of action along with a timeline of implementation [38,57]. Despite organizational policies, it is difficult for an organization to convert itself greener, because it depended very much on the individual role. That is why it is not only linked to the organization, but also on individuals [58]. Accordingly, the organizational policies success is influenced by an individual positive attitude toward green IT, as a new pattern of behavior also influenced the organizational strategies [59–61]. A study that was conducted by Liang et al. [62] explains that IT systems related investment only depends on the willingness of individuals' commitment and participation in broader strategies and activities of the organization. Moreover, a review on green IT that was conducted by Asadi et al. [12] suggested that there is less study on individual perspective than an organizational perspective. Therefore, this research focuses on the individual perspective of green IT adoption, as organization adoption also depends on individuals.

Theory of Consumption Value

Convincing, value for money, habit, health concern, and individual social and institutional norms influence consumptions on daily bases [44]. Theory of consumption value presented by Sheth et al.

explains this consumption behavior [41]. This theory stands on three principals: (1) consumption behavior is a function of multiple consumption values, (2) the contribution of each value differ significantly in a given situation, and (3) each value is independent of each other [63]. According to Sheth et al. [41], "consumer choice is the function of multiple consumption values like functional, social, epistemic, emotional and conditional values". It explains why consumers buy or not buy specific products, why consumer chose a product over others, or why not chose and same for brand [45]. These values have different performance while choosing a product for different individuals [64]. This theory is used in several studies to explain the consumption behavior, identifying consumer perception, and consumer segmentation in different product categories [65]. Recently, this theory is used to measure the consumption behavior of green and environmental sustainability products [44–46,66]. While some studies take some of the values from these five values and some studies explain the additional values in a green consumption context. Table 1 explains the use of the theory of consumption values in green and pro-environmental consumption behavior in a different context. This study includes five basic consumption values (functional, social, epistemic, emotional, and conditional value) and an additional value, i.e., religious value. All of these values are explained further with supporting evidence for the green context.

Table 1. Theory of consumption values used in the green context.

Year	Authors	Country	Context	Findings
2012	P. C. Lin & Huang	Taiwan	Green Products	The results of this study reveal that consumer choice regarding green products mainly influence by psychological benefit, desire for knowledge, novelty seeking and specific conditions.
2015	Wen & Noor	Malaysia	Hybrid car	Functional value influenced the intentions towards hybrid car purchasing. While symbolic, novelty and emotional values do not influence the intention.
2015	Suki & Suki	Malaysia	Green products	Empirical investigation conclude that functional value price, emotional value and conditional value have no significant effects. Social values impact most preceding by epistemic and functional value quality.
2017	Hassan Rahnama	Iran	Organic products	The study suggested that epistemic value and health value have the highest impact on consumer choice behavior.
2017	Solaiman et al.	Bangladesh	Environment-friendly and energy efficient Electronics	By taking the corporate image as an additional value the researchers found that corporate image, functional, social, conditional values influence green consumption behavior of environment-friendly and energy efficient electronic products.
2018	Wang et al.	China	Green Products	This study compares male and female towards green consumption behavior and found female have higher conditional and epistemic value.

Functional Value

Functional value is the basic value that influences the purchasing decision of the consumer. It is the perceived utility to attain the physical and utilitarian benefits of the product, like performance, durability, quality, and price [41]. Suki & Suki [67] suggested that quality and price influence consumer choice while purchasing products. In regard to green products, the functional value is a perceived net utility that is obtained by consumption green products for its salient features and utilitarian benefits, especially price concern [66]. However, the consumer takes other criteria for choosing products if the prices are very high [43]. It is also said that price and quality influence green products purchasing [68] and consumers are now paying high prices for the green products [69]. Finch [70] also suggested that functional value drives the purchase of the green product. Researchers explain that green IT products are energy efficient but green IT adoption is slow due to the cost that is associated with

green IT [2]. Accordingly, green IT adoption is associated with functional value. Therefore, it can be hypothesized that:

H1. *Functional value positively influences consumer intention to adopt green IT products.*

Social Value

Social value is the perceived utility attained from different alternatives association of different social groups [41]. It is a key driving force behind consumer choice and the sense of social responsibility influences environmental behavior [40]. Kumar & Ghodeswar [71] stated that, if others appreciate environmental behavior, the consumer is motivated in consuming green products. Social value for green products is the perceived utility that is obtained by consuming green products by the association of reference group or social pressure and prestige [63]. Consumers who purchase green products motivate others to do so to save the environment [72]. Several studies found that green purchase behavior influences social values [43,46,67]. Some studies could not find any influence of social value on green consumption value [63,66]. These past results indicate the need for further clarification of this relationship. Hence, in the context of green IT, it is hypothesized that:

H2. *Social value positively influences consumer intention to adopt green IT products.*

Epistemic Value

Epistemic value is the perceived utility attained by the alternative capacity of the new knowledge and novelty in products and services [41]. Basically, when consumers are bored from old products features, design, and characteristics, they consume new products and then epistemic value occurs [40]. In regards to green products, it is the utility gain by the disclosure of characteristics, information, and knowledge regarding the green products [63]. It is also said that a lack of knowledge creates a gap in attitude and actual buying behavior [73]. Maniatis [74] suggested that knowledge plays a vital role in decision making to consume green products. According to Lin & Huang [66], an epistemic value significantly influences consumer behavior towards green products. Some recent studies also confirmed this relationship [46,63,72,75]. As a green, IT is an emerging concept and is less researched in Pakistan. Therefore, green IT is associated with epistemic value and it can be hypothesized:

H3. *Epistemic value positively influences consumer intention to adopt green IT products.*

Emotional Value

Emotional value is "the perceived utility acquired from an alternative's capacity to arouse feelings or affective states measured on a profile of feelings associated with the alternative" [41]. It is also argued that consumer consumption behavior varies according to the emotional states that vary in every situation. These emotional values are considered to be key components of attitude and influence consumer preferences and choices [76]. Kilbourne & Pickett [77] argue that environment protective feeling alters consumer behavior, and consumers "go green". Rahnama [45] also explain that green consumption arises from different comfort feelings that influence consumer choice of green products over conventional products. This emotional value leads towards green consumption behavior [39,66,70,78], while several studies suggest that emotional value does not influence green consumption behavior [40,46,63,67,79]. This contradiction creates a need for further research. Accordingly, it is hypothesized that:

H4. *Emotional value positively influences consumer intention to adopt green IT products.*

Conditional Value

Conditional value is the perceived utility attained by the alternative as a result of specific situations and circumstances by decision makers [41]. Situations, like time and places, affect the purchasing behavior of the consumer based on knowledge, product characteristics, and other conditional factors [80]. Gadenne et al. [81] explain that changes in situations may affect consumer green purchase behavior. Conditional value for green products can be explained as the net utility drive by the consumption of green products over conventional substitutes based on the perceived willingness to obtain some personal benefits [63]. Wen & Noor [39] explain that conditional value in the form of a cash rebate or government subsidy might drive the green purchase behavior. Hence, it can be said that the conditional value is associated with green IT adoption. Conditional value influencing the green consumption behavior is also supported by some previous researches [43,66,82]. However, some researches could not find any relationship [46,63,67]. Therefore, it can be hypothesized that:

H5. *Conditional value positively influences consumer intention to adopt green IT products.*

Reasons to Include Religious Values

Religion is one of the important elements of social behavior and it is being studied by different perspectives [83]. Wilkes et al. first studied religiosity as an influencer in consumption behavior [84], in which they explain that religiosity influences consumer choice. Moreover, environmental protection and ecological consumption are guided by different religions like Christian-Jews, Buddhism, Hindus, and Islam [49]. It is also argued that the environmental behavior of individuals varies for different religion followers [85], but found a significant effect on different product categories, like Fashion [86,87], green products [49,51,53,88], plant disposable utensils [89], and new product adoption [90–92].

Religious Value

Religious value is the perceived utility attained by the consumer choice influenced by its religiosity. In regard to green products, this is the value that is attained by the purchasing of green products over conventional products due to beliefs and ethics originated by religion. In Islam, humans are "Khalifahs" vicegerent of GOD (Allah), who are a trustee and accountable for the resources they used (Quran, 6:165). These religious values are guided by scriptures, which is "Quran and Sunnah" in Islam. Allah in "Quran" and the Holy Prophet by "hadith" taught the human beings the living pattern by protecting the nature, environment, other creatures, and the earth [53]. For example, a few of the verses from the Quran:

"Who made all things good which He created (Quran, 32:7). And we are commanded to keep it that way: Do no mischief on the Earth, after it hath been set in order". (Quran, 7:56)

"Then We appointed you viceroys in the Earth after them, that We might see how you behave". (Quran 10:14)

These verses clearly indicate that humans are given the responsibility for protecting the Earth in every aspect of life. It is further clearer by the "Hadith". For example, described by Anas bin Malik that the Prophet Muhammad (S.W.A) said:

"If a Muslim plants a tree or sows seeds, and then a bird, or a person or an animal eats from it, it is regarded as a charitable gift (sadaqah) for him". (Sahih Bukhari, 513)

Asked about what the Prophet used to do in his house, the Prophet's wife, 'Aishah (may Allah be pleased with her), said that:

"He used to repair his shoes, sow his clothes and used to do all such household works done by an average person". (Authenticated by Al-Albani)

These hadiths clearly describe the environmental concern and used recycled products before buying new products to save natural resources. These religious (Islamic) values influence the feeling of people regarding consumption (like and dislike), which leads towards consumption behavior [93–95]. It is also suggested by recent researches that these religious values influence the ecological and green consumption behavior [48,51,53]. Rehman & Shabbir [90] explain that Muslims consumers are influenced by religious values when it comes towards new product adoption. As a green, IT is an ecological and new concept in Pakistan. Accordingly, it is hypothesized that:

H6. *Religious value positively influences consumer intention to adopt green IT products.*

Based on these hypothesis, the study proposed a theoretical framework (see Figure 1) by integrating TCV and religious value.
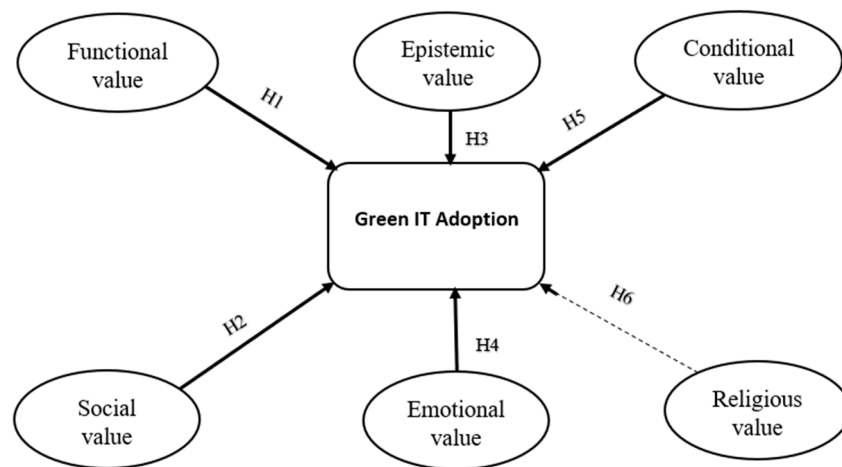

Figure 1. Theoretical framework.

2. Materials and Methods

This study was conducted in Pakistan. Pakistan was chosen as the research setting, because it is facing serious environmental issues in term of first order effect (e-waste generation) and second order effect (high volume of energy consumption). Moreover, Pakistan is the second largest Muslim country, having 97% population of Muslims [96]. Furthermore, Individuals in Pakistan are ideologist, presenting a strong association with their religion and Islam has a puissant motivational force [97]. The religious value of this population becomes important due to practicality. The sampling population of this study consisted of a wide spectrum of residents of five major metropolitan cities of Punjab (Multan, Sahiwal, Faisalabad, Sargodha, and Lahore). Residents of metropolitan cities were chosen, because the demand for green products notably surges in metropolitan cities. The survey method was conducted during the month of November 2017 to February 2018 to collect data through a self-administered questionnaire. The questionnaire of this study was divided into two sections. Section A captures the demographic information of the respondents (see Table 2). Section B captures the exogenous and endogenous constructs measurement that was developed from prior literature. Consumers intention to adopt green IT products were measured using four items that were developed by Nguyen et al. [98]; e.g., I intend to buy green IT products. The functional value was measured using four items adapted from Biswas & Roy [43]; e.g., green IT products are good products for the price. The social value was measured using four items that were adapted from Rahnama & Rajabpour [46]; e.g., buying the green IT product would help me to feel acceptable. The epistemic values were measured using three items adapted from Biswas & Roy [43]; e.g., I would prefer to gain substantial information on green IT products before purchase. The emotional value was measured using three items adapted from Lin & Huang [66]; e.g., buying the green IT product instead of conventional products would make

me feel like a better person. Conditional values were measured using four items that were adapted from Rahnama & Rajabpour [46]; e.g., I would buy the green IT product instead of conventional products when there is a subsidy for green IT products. Religious values were measured using six items that were adapted from Plante and Boccaccini [99]; e.g., my religious faith is extremely important to me. Each item was answered on seven-point Likert scale, which ranged from strongly disagree = 1 to strongly agree = 7. Non-probability (purposive) sampling is employed in this research, as it provides a representative sample when there it is problematic to access the complete sampling frame. According to Calder et al. [100], in this regard, non-probability sampling is appropriate for theoretical generalization. The price of green products is a key determinant in the pro-environmental behavior [101]. Green products are more expensive than conventional products, which make price an obstacle in green purchase behavior. Hence, an assessment of income level of green product buyers become very important. That is why residents were chosen, representing the middle-class consumer in Pakistan with an income level above Rs50000 [102]. The sample size determination is based on Comery & Lee [103] proposed rule of thumb, which suggests the sample size 50 as poor, 300 as good, 500 as very good, and 1000 take into account as excellent for statistical analysis. Hence, the 500 sample size is adequate in generating reliable and valid results. Nulty [104] noted that the response rate of questionnaires is 40% to 60%. Accordingly, based on the guidelines of Nulty [104], the researchers of the intended study distributed 1000 questionnaires, in which 624 were returned, and finally 536 were found to be useable for the present study after the primary screening.

Table 2. Demographic profile of respondents.

	Characteristics	Frequency	Percentage%
Gender	Male	320	59.7
	Female	216	40.3
Age	16-24	64	11.9
	25-34	78	14.6
	35-44	191	35.6
	45-54	114	21.3
	55-64	68	12.7
	>65	21	3.9
Martial	Single	127	23.7
	Married	409	76.3
Education	Intermediate or below	162	30.2
	Undergraduate	215	40.1
	Graduate	106	19.8
	Professional	53	9.9
Occupation	Government Sector	126	23.5
	Private Sector	205	38.2
	Self-Employed	82	15.3
	Student	41	7.6
	Retired	82	15.3
Income	50,000–75,000 Rs	162	30.2
	75,001–100,000	215	40.1
	100,001–125,000	106	19.8
	125,001–over	53	9.9
Green IT product Preferences	Desktop Computer	44	8.2
	Printer	133	24.8
	Scanner	14	2.6
	Laptop	217	40.5
	Multimedia Projector	2	0.4
	Communication Systems (Telephone-Intercom)	51	9.5
	Closed Circuit Television (CCTV)	75	14.0

3. Results

This study used the partial least squares structural equation modeling (PLS-SEM) to examine the research model instead of covariance-based structural equation modeling (CB-SEM). PLS-SEM was incorporated through the Smart PLS 3.0 software, by using a method of bootstrapping (5000) [105]. PLS-SEM has been employed for two main reasons. First, the purpose of this study is to determine the key predictors of the intention to adopt green IT products rather than theory confirmation. Second, in this study, data normality cannot be verified, because, in social science, studies data tend to have normality issues [25,106]. We analyzed the developed model by using a two-stage approach, in which the measurement model is assessed first, followed by the structured model [107,108].

3.1. Measurement Model

The reliability test (item reliability, internal consistency reliability) and validity test (convergent validity, discriminant validity) were conducted to evaluate the adequacy of the measurement model [108]. As mentioned in Table 3, all of the items loadings exceeded the minimum threshold value of 0.40 [109]. The internal consistency reliability of all variables is greater than the cut-off value of 0.7 [110] (see Table 3). According to Hair et al. [110], to confirm the convergent validity, the average variance extracted (AVE) of all constructs is well above the minimum threshold value of 0.5. The results showed that all the AVE values of endogenous and exogenous constructs in this study are between 0.516 (religious value) and 0.734 (Intention to adopt green IT) (Table 3, Figure 2), thus confirming their convergent validity.
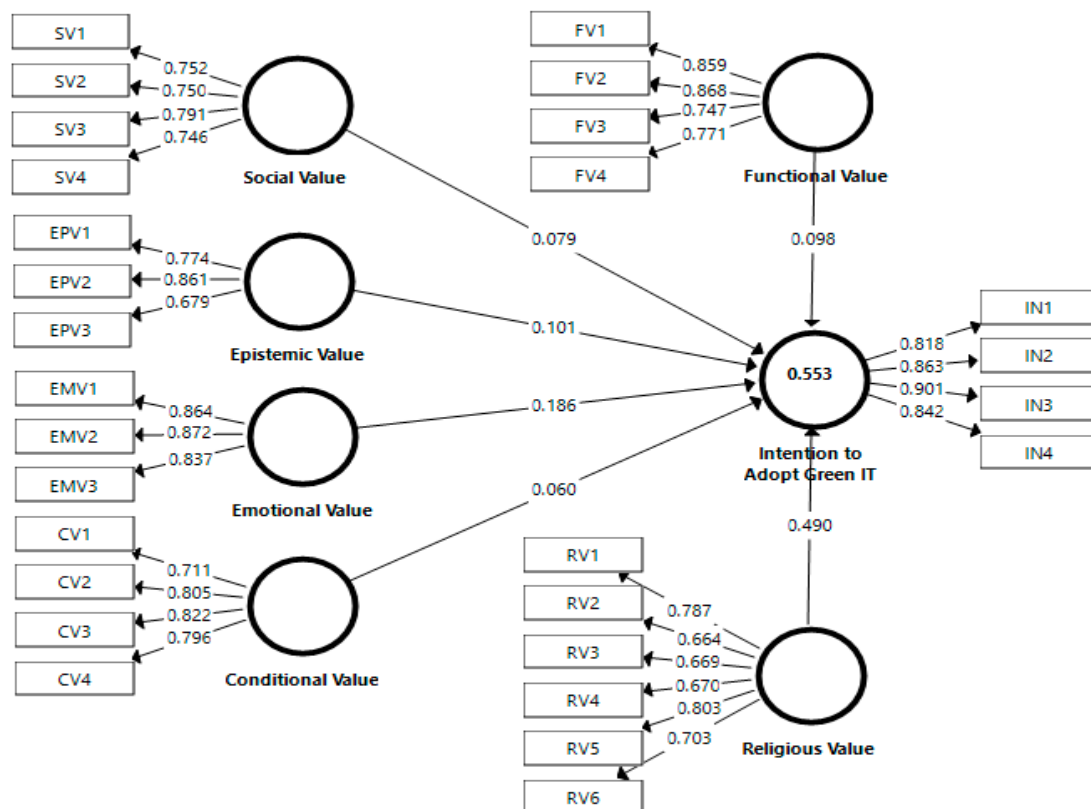

Figure 2. Measurement Model (PLS Algorithm results)

Table 3. Measurement Model Results.

Construct	Item	Loadings	CR	AVE
"Green IT products are good products for the price."	FV1	0.859	0.886	0.661
"Green IT products are economical for the attributes they offer."	FV2	0.868		
"Green IT products have an expectable standard quality."	FV3	0.747		
"Green IT products are made from non-hazardous substances."	FV4	0.771		
"Buying the green IT product would help me to feel acceptable"	SV1	0.752	0.845	0.578
"Buying the green IT product would improve the way that I am perceived"	SV2	0.750		
"Buying the green IT product would make a good impression on other people"	SV3	0.791		
"Buying the green IT product would give its owner social approval"	SV4	0.746		
"I prefer to check the eco-labels and certifications on green IT products before purchase."	EPV1	0.774	0.817	0.601
"I would prefer to gain substantial information on green IT products before purchase."	EPV2	0.861		
"I want to have a deeper insight of the inputs, processes, and impacts of products before purchase"	EPV3	0.679		
"Buying the green IT product instead of conventional products would feel like making a good personal contribution to something better."	EMV1	0.864	0.893	0.736
"Buying the green IT product instead of conventional products would feel like the morally right thing."	EMV2	0.872		
"Buying the green IT product instead of conventional products would make me feel like a better person"	EMV3	0.837		
"I would buy the green IT product instead of conventional products under worsening environmental conditions"	CV1	0.711	0.865	0.616
"I would buy the green IT product instead of conventional products when there is a subsidy for green IT products"	CV2	0.805		
"I would buy the green IT product instead of conventional products when there are discount rates for green IT products or promotional activity"	CV3	0.822		
"I would buy the green IT product instead of conventional products when green IT products are available"	CV4	0.796		
"My religious faith is extremely important to me"	RV1	0.787	0.864	0.516
"I look to my faith as a source of inspiration"	RV2	0.664		
"I look to my faith as providing meaning and purpose in my life"	RV3	0.669		
"My faith is an important part of who I am as a person"	RV4	0.670		
"My relationship with God is extremely important to me"	RV5	0.803		
"My faith impacts many of my decisions"	RV6	0.703		
"I will consider buying green IT products."	IN1	0.818	0.917	0.734
"I plan to switch to other brands/versions of green IT products that are more energy efficient."	IN2	0.863		
"I intend to buy green IT products."	IN3	0.901		
"I will buy green IT products in my next purchase."	IN4	0.842		

For the adequacy of discriminant validity, the Fornell and Larcker [111] criterion were considered. Fornell and Larcker [111] criterion required that the squared root of AVEs (diagonal values) should be higher than the correlations between the latent constructs (off-diagonal values). In Table 4, results indicate that there is discriminant validity between all of the constructs.

Table 4. Discriminant Validity-Fornell-Larcker Criterion.

	CV	EMV	EPV	FV	IN	RV	SV
CV	0.785						
EMV	0.045	0.858					
EPV	0.318	0.348	0.775				
FV	0.428	0.196	0.759	0.813			
IN	0.366	0.308	0.509	0.554	0.857		
RV	0.405	0.098	0.454	0.579	0.676	0.719	
SV	0.324	0.213	0.348	0.421	0.466	0.514	0.760

3.2. Structured Model

It is important to assess that there is no collinearity issue in the inner model, before assessing the structural model. Table 5 shows the collinearity test of the model. The VIF values for each construct are less than 3.3, which means that there is no collinearity issue [112].

Table 5. Assessment of Collinearity.

	Intention to Adopt Green IT
Functional value	2.986
Social value	1.462
Epistemic value	2.614
Emotional value	1.187
Conditional value	1.302
Religious value	1.794

Following Hair et al. [109], once the construct validity is assessed and established, the second step was to test the structured model. The assessment of structured model was based on path coefficient (β values), corresponding t-values, the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) [110]. Using a bootstrapping procedure with 5000 re-samples accessed the significance of the path coefficient. The results indicate that all six structural relationships were significant. The results showed that religious value (β = 0.490, t = 12.860 > 1.64, $p < 0.05$), functional value (β = 0.098, t = 1.763 > 1.64, $p < 0.05$), social value (β = 0.079, t=2.204 > 1.64, $p < 0.05$), epistemic value (β = 0.101, t = 2.080 > 1.64, $p < 0.05$), emotional value (β = 0.186, t = 5.327 > 1.64, $p < 0.05$), and conditional value (β = 0.060, t = 1.752 > 1.64, $p < 0.05$) were quite significant on the intention to adopt green IT products. Hair et al. [108] indicated that (R^2) values of 0.25, 0.50 or 0.75 could be described as weak, moderate, and substantial. The (R^2) of intention was 0.554, which was higher than the substantial level, based on Hair et al. [108] criterion. The effect size (f^2) assesses the impact of an exogenous construct on an endogenous construct [109]. Cohen [113] stated that an (f^2) value of 0.02, 0.15, and 0.35 can be described as small, medium, and large effects, respectively, as shown in Table 6. The predictive relevance (Q^2) value considerably above 0 shows that the model has predictive relevance. Table 5 shows that the Q^2 value for intention (Q^2 = 0.375) was greater than 0, which suggests that the model has significant predictive relevance.

Table 6. Results of SEM and Hypothesis Testing.

Hypothesis	Relationship	Path Coefficient	Std. Error	t Value	*p*-Value	Supported	R^2	Q^2	F^2
H1	FV→IN	0.098	0.056	1.763	0.039	Yes	0.553	0.375	0.007
H2	SV→IN	0.079	0.036	2.204	0.014	Yes			0.010
H3	EPV→IN	0.101	0.049	2.080	0.019	Yes			0.009
H4	EMV→IN	0.186	0.035	5.327	0.000	Yes			0.065
H5	CV→IN	0.060	0.034	1.752	0.040	Yes			0.006
H6	RV→IN	0.490	0.038	12.86	0.000	Yes			0.299

4. Discussion

Marketers and researcher have paid many intentions towards green consumption behavior over the last few decades [40]. The study tried to find the intentions of individuals towards green IT adoption in Pakistan. This study used the theory of consumption value i.e., functional value, social value, epistemic value, emotional value, and conditional value as the predictors to find the intentions of individuals. Moreover, the influence of an additional value i.e., Religious value on green IT adoption, has also been tested. Results reveal that functional value, social value, epistemic value, emotional value, conditional value, and religious value significantly positively influence the adoption of green IT in Pakistan.

The findings suggest that functional value plays a vital role in green IT adoption in Pakistan with the ($\beta = 0.098$, t = $1.763 > 1.64$, $p < 0.05$). The study's results are consistent with the previous research findings [39,40,43,46]. Biswas & Roy [43] suggested that the quality and price of green products are important in a consumer purchase decision. Accordingly, this can be due to the effectiveness and efficient performance of green IT products in reducing the e-waste and energy consumption, Individuals in Pakistan intent to involve in green IT adoption. Energy crises of Pakistan make individuals think about different ways to overcome energy consumption problems, like the perceived quality and performance of energy-efficient electronic products in Bangladesh influencing consumer to become involved in green consumption [40]. Hence, practitioners should innovate the technologies that use less energy, can be recycled, or disposed of to reduce the harmful effect of technologies. The development of IT products should involve the durability and suitability of the products, because 70% respondents represent middle age and elderly age group. According to Herve´ and Mullet [114], this group focuses more on the rational decision making, depending on durability and suitability. Moreover, the returning policy of used IT products can also be initiated to follow the proper recycling and dumping procedure of IT products by the manufacturers, which will help in saving the environment.

The result suggested that social value is an important factor influencing green IT adoption of individuals in Pakistan with ($\beta = 0.079$, t = $2.204 > 1.64$, $p < 0.05$). This study justified the results of previous studies [40,43,46,64]. The probable reason for that result is the collective society of Pakistan identified by Hofstede [115] definition of collectivism. In Pakistan, consumers are heavily reliant with their reference group in the decision-making process, due to a collective society. Consumers gain the same meaning of consumption of a product that of their social groups and this creates a social identity. These social identifications prompt the symbolic value in the consumers among their peer group by consuming environment-friendly products. Due to these symbolic values, consumers like to buy green products when consumer identified social approval and a good impression on others [46]. Moreover, Kumar & Ghodeswar [71] suggested that, if environmental behavior is appreciated, there is more chances to be in green consumption behavior. In this regard, this study also shows that their friends, family, and peer group influence Pakistani individuals to adopt green IT and become involved in green consumption behavior.

Like functional and social value, the adoption of green IT is influenced by epistemic value with ($\beta = 0.101$, t = $2.080 > 1.64$, $p < 0.05$). It is associated with the knowledge and novelty seeking new products. The results are in agreement with the study of [45,46,63,66,72,75,79]. The epistemic value is basically associated with knowledge and novelty of the products. Accordingly, in the case of green IT adoption, the findings of this study reveal that consumer intent to involve in green IT adoption when they have knowledge of the environmental problems of IT in energy consumption and creating e-waste. This result can be due to the experience of new things, like green or environment-friendly products when consumers get the knowledge and novelty in these products. Recently, Wang et al. [65] identified that consumers are curious about green products and they seek novelty in the products. This knowledge is needed on every step of the decision-making process, especially in evaluating the alternatives and making a decision either go for a green product or not. Hence, in the case of green IT products, practitioners can create awareness of e-waste and energy crises in Pakistan, which increase individuals' curiosity to adopt green IT. Moreover, the manufacturers can initiate the awareness of

the IT products that are energy efficient and less harmful to the environment through different media channels. With this awareness, knowledge of the dispose off or recycling procedures of these IT products can be given to the consumers to reduce e-waste in Pakistan.

Emotional value is utility obtained by the emotions i.e., joy, excitement, feel good, pleasure, and satisfaction of individuals derived by the environment-friendly consumption. The study finds that emotional value influences the green IT adoption in Pakistan with (β = 0.186, t = 5.327 > 1.64, p < 0.05). The result is in line with [39,64,66,70,75,116] and contradicts with [40,43,46,63,65,72,79]. However, in Pakistan, this study reveals that emotional value influences the intentions of consumers towards green IT adoption. This can be due to the fact that Pakistani consumers decision, making is more emotional than rational [47], which influence them to become involved in green IT adoption. Emotions are part of humans in every aspect of daily life. These emotions involve positive feelings, like joy, enjoyment, excitement, feeling of pleasure, and doing good and negative feelings, such as fear, anger, and anxiety. Individuals, who are going green, experience a positive feeling of acting well as they are contributing in safeguard of the environment and natural resources [66]. Accordingly, the adoption of green IT arouses feelings of comfort, security, and most specifically satisfaction of not contributing to the environmental degradation and saving the energy resources.

Conditional value has also a positive and significant impact on green IT adoption in Pakistan, with (β = 0.060, t = 1.752 > 1.64, p < 0.05). The results are in line with previous researches [43,64–66,75] which said that conditional value is important factor for the green consumption, but this finding has contradictions with results of previous studies [45,46,63,72,79]. Conditional value is attained by different situations or conditions, like time, place, cash rebate, discounts, and government subsidy during the decision making of green consumption [39]. It means that intentions of individuals are influenced by the time of usage, place of buying or using IT products, any cash rebate, and discounts that are available for adopting green IT products. In this regard, marketers can enhance this adoption by involving different discounts and promotion strategies at the store. Moreover, the reduction in energy demand and e-waste can be achieved by providing subsidy or cash rebate by the government on the purchase of green IT products.

This study includes religious value as an additional value in the context of green IT. The results of the study suggest that religious value impacts individuals' intentions towards green IT adoption in Pakistan, with (β = 0.490, t = 12.860 > 1.64, p < 0.05). The finding is in agreement with the results of [48–51,53]. This can be due to the fact that Islam has a big influence on Muslim consumers while consuming different products. Muslims buy products that are halal or made by the halal ingredients, as any act according to the preaching of Islam becomes an act of worship for Muslims. Muslims learn from shariah to take care of Earth and live peacefully, which influences the ecological consumption behavior of the Muslims [53]. Muslims live their life according to Quran and Hadees, which guide them to protecting the environment, save resources, and not damaging the earth.

Moreover, according to Pew Growth Report [117], Islam is the fastest growing religion in the world and, by 2050, Muslims will be 30% of the world population (2.8 billion), on par with Christian making 31% (2.9 billion). Muslims will be 10% of Europe population and will surpass Jews in the US. These statistics about Muslims make a very important segment for policy makers and managers to study from a marketing point of view [51]. In Pakistan, 97% of the population is Muslim and religious values influence their behavior. Religion has a strong influence on the lifestyle of individuals in Pakistan. According to Huaibin [97], Pakistanis like to be represented by their religion rather than their nationality as compared to western countries, which prefer to show their identity by their nationality. In the green IT context, religious values also influence the intentions of the consumer to adopt green IT in Pakistan. They considered themselves the "Khalifa of Allah" and they have the responsibility to save the earth for future generations, plants, and animals. For this purpose, the marketers should involve proper integrated marketing communication tools according to the religious values of Muslims to involve them in green IT adoption. A proper message can be conveyed through involving the verses

of Quran and Hadees, which will peruse them not only adopt the green IT, but also not to contribute to e-waste generation.

Practically, these results are helpful for the government and policymakers. The government should have separate legislation that must address e-waste management and policy that technically shows the prevention of pollution by e-waste. There should be some SOP's measures for the formation of formal e-waste, disposal, and recycling facilities. In this regard, the government of Pakistan may introduce a returning policy system of IT products by the experience of other developed nations. Refurbishment and the recycling industries must be strengthened by ventures with international companies. Furthermore, encouragement of the consumption and the importation of electronic/electrical equipment that is aligned with the international laws/ regulations should be initiated [118]. With these regulations, public awareness can also play a vital role; for example, the education must be given to recyclers, scrapers, manufacturers, and the public regarding the threat to the health and the environment by e-waste, so that they transfer themselves from conventional IT products to green IT products. Moreover, the government should provide incentives to IT products importers to import those products that consume less energy. Reducing duties on these importations can also be beneficial for this cause.

Limitation and Future Directions

This research still has some limitations and recommendations for future research despite the implication of this study for researchers and practitioners. First, this study has taken all IT products into account for measuring individual intentions towards green IT adoption. Future researches can explore individuals' intentions on specific IT products, like laptops, mobile phones, and printers, etc., depending on usage in a specific country. Second, the research has confirmed Hofstede's one cultural dimension i.e., collectivism in the context of green IT adoption. Future researchers can compare the individual's intentions with respect to different cultural dimensions in green IT products adoption. Third, this research has extended the theory of consumption value by adding religious value in the green IT context. Future research can extend this theory by adding other individual values, like egoistic value and altruistic value in green consumption behavior. Fourth, this study is only limited to individual intentions. Although intentions are a good predictor of behavior, it is also found that there is a gap in the intention to use and the actual use of the consumers. Hence, future research can also check the behavior of the individuals towards green IT adoption.

5. Conclusions

The aim of the study is to find the individual intention towards green IT adoption in Pakistan through five basic values of TCV and an additional value i.e., religious value. For this purpose, a theoretical model is developed that is based on functional, social, epistemic, emotional, conditional, and religious value as predictors of consumer intentions to adopt green IT products. Data was collected from the citizens from metropolitan cities of Pakistan through a self-administrative questionnaire. Variance-based structural equation modeling is used to examine the hypothesis and all six hypotheses are supported.

The results of SEM suggested that functional, social, epistemic, emotional, conditional, and religious values have a positive and significant impact on green IT adoption. These results have similarities and contradictions with past researches in the green context. That can be due to the specific categories in green products and cultural differences of the respondents. In Pakistan, the performance and effectiveness of green IT products motivate individuals to become involved in green IT adoption. At the same time, individuals adopt these products not to become involved in energy crises and environmental degradation as an act of social approval and satisfaction. The knowledge of these new products enhances the curiosity of the IT users by which they intend to adopt green IT. Accordingly, practitioners can create awareness about the benefits and efficiency of green IT products with the environmental problems and energy issues that are created by IT products simultaneously. Moreover, Islam as an influencer plays a vital role in the adoption of green IT in Pakistan as the religious value has

the highest impact on individual intentions. Hence, marketers can benefit via this finding by including religious values in their marketing campaigns and avoiding deceptive marketing strategies to motivate consumers towards green IT adoption. The Islamic perspective on environmental sustainability and resource saving can be addressed in the advertisement for green IT products.

Finally, we hope that the researchers, organizations, especially the manufacturers of IT products, can utilize the findings of this research to address the motives and preferences of green consumers, which will be helpful for environmental sustainability and protection.

References

1. Yadav, R.; Pathak, G.S. Determinants of Consumers' Green Purchase Behavior in a Developing Nation: Applying and Extending the Theory of Planned Behavior. *Ecol. Econ.* **2017**, *134*, 114–122. [CrossRef]
2. Dezdar, S. Green information technology adoption: Influencing factors and extension of theory of planned behavior. *Soc. Responsib. J.* **2017**, *13*, 292–306. [CrossRef]
3. Haytko, D.; Matulich, E. Green advertising and environmentally responsible consumer behaviors: Linkages examined. *J. Manag. Mark. Res.* **2008**, *1*, 1–11.
4. Do Paço, A.; Shiel, C.; Alves, H. A new model for testing green consumer behaviour. *J. Clean. Prod.* **2019**, *207*, 998–1006. [CrossRef]
5. Konuk, F.A.; Rahman, S.U.; Salo, J. Antecedents of green behavioral intentions: A cross-country study of Turkey, Finland and Pakistan. *Int. J. Consum. Stud.* **2015**, *39*, 586–596. [CrossRef]
6. Choi, D.; Johnson, K.K.P. Influences of environmental and hedonic motivations on intention to purchase green products: An extension of the theory of planned behavior. *Sustain. Prod. Consum.* **2019**, *11*, 1–11. [CrossRef]
7. Zahid, M.M.; Ali, B.; Ahmad, M.S.; Thurasamy, R.; Amin, N. Factors Affecting Purchase Intention and Social Media Publicity of Green Products: The Mediating Role of Concern for Consequences. *Corp. Soc. Responsib. Environ. Manag.* **2018**, *25*, 225–236. [CrossRef]
8. Patón-romero, J.D.; Baldassarre, M.T.; Rodríguez, M.; Piattini, M. Computer Standards & Interfaces Green IT Governance and Management based on ISO/IEC 15504. *Comput. Stand. Interfaces* **2018**, *60*, 26–36.
9. Deng, Q.; Ji, S.; Wang, Y. Green IT practice disclosure: An examination of corporate sustainability reporting in IT sector. *J. Inf. Commun. Ethics Soc.* **2017**, *15*, 145–164. [CrossRef]
10. Gholami, R.; Binti, A.; Ramayah, T.; Molla, A. Information & Management Senior managers' perception on green information systems (IS) adoption and environmental performance: Results from a field survey. *Inf. Manag.* **2013**, *50*, 431–438.
11. Balde, C.P.; Forti, V.; Gray, V.; Kuehr, R.; Stegmann, P. *The Global E-Waste Monitor 2017: Quantities, Flows and Resources*; United Nations University: Bonn, Geneva; International Telecommunication Union: Bonn, Geneva; International Solid Waste Association: Bonn, Geneva, 2017.
12. Asadi, S.; Razak, A.; Hussin, C.; Mohamed, H. Organizational research in the field of Green IT: A systematic literature review from 2007 to 2016. *Telemat. Inf.* **2017**, *34*, 1191–1249. [CrossRef]
13. OECD/IEA, International Energy Agency. *Global Energy & CO_2 Status Report 2017*; International Energy Agency: Paris, France, 2018.
14. Sanita, F.; Udin, Z.M.; Hasnan, N. Green it/s adoption within gscm in indonesian construction industry: An elucidation and practice. *J. Inf. Syst. Technol. Manag.* **2017**, *2*, 105–116.
15. Melville, N.P. Information systems innovation for environmental sustainability. *MIS Q.* **2010**, *34*, 1–21. [CrossRef]
16. Sedera, D.; Tushi, B.; Tan, F. Multi-disciplinary Green IT Archival Analysis: A Pathway for Future Studies Pathway for Future Studies. *CAIS* **2017**, *41*, 28. [CrossRef]
17. Ainin, S.; Naqshbandi, M.M.; Dezdar, S. Impact of adoption of Green IT practices on organizational performance. *Qual. Quant.* **2016**, *50*, 1929–1948. [CrossRef]

18. Tushi, B.T.; Sedera, D.; Recker, J. Green IT Segment Analysis: An Academic Literature Review. *Am. Conf. Inf. Syst.* **2014**, 1–15.

19. Ham, M.; Jeger, M.; Ivković, A.F. The role of subjective norms in forming the intention to purchase green food. *Econ. Res. Istraz.* **2015**, *28*, 738–748. [CrossRef]

20. Nam, C.; Dong, H.; Lee, Y.A. Factors influencing consumers' purchase intention of green sportswear. *Fash. Text.* **2017**, *4*, 2. [CrossRef]

21. Barber, N. Green wine packaging: Targeting environmental consumers. *Int. J. Wine Bus. Res.* **2010**, *22*, 423–444. [CrossRef]

22. Ko, S.B.; Jin, B. Predictors of purchase intention toward green apparel products. *J. Fash. Mark. Manag. An Int. J.* **2017**, *21*, 70–87.

23. Yong, N.L.; Ariffin, S.K.; Nee, G.Y.; Wahid, N.A. A Study of Factors influencing Consumer's Purchase Intention toward Green Vehicles: Evidence from Malaysia. *Glob. Bus. Manag. Res.* **2017**, *9*, 281–297.

24. Hsu, C.L.; Chang, C.Y.; Yansritakul, C. Exploring purchase intention of green skincare products using the theory of planned behavior: Testing the moderating effects of country of origin and price sensitivity. *J. Retail. Consum. Serv.* **2017**, *34*, 145–152. [CrossRef]

25. Ali, S.; Ullah, H.; Akbar, M.; Akhtar, W.; Zahid, H. Determinants of Consumer Intentions to Purchase Energy-Saving Household Products in Pakistan. *Sustainability* **2019**, *11*, 1462. [CrossRef]

26. Sthiannopkao, S.; Wong, M.H. Handling e-waste in developed and developing countries: Initiatives, practices, and consequences. *Sci. Total Environ.* **2013**, *463–464*, 1147–1153. [CrossRef]

27. Iqbal, M.; Breivik, K.; Syed, J.H.; Malik, R.N.; Li, J.; Zhang, G.; Jones, K.C. Emerging issue of e-waste in Pakistan: A review of status, research needs and data gaps. *Environ. Pollut.* **2015**, *207*, 308–318. [CrossRef]

28. Iqbal, M.; Syed, J.H.; Breivik, K.; Chaudhry, M.J.I.; Li, J.; Zhang, G.; Malik, R.N. E-Waste Driven Pollution in Pakistan: The First Evidence of Environmental and Human Exposure to Flame Retardants (FRs) in Karachi City. *Environ. Sci. Technol.* **2017**, *51*, 13895–13905. [CrossRef]

29. Imran, M.; Haydar, S.; Kim, J.; Rizwan, M.; Ali, A. Resources, Conservation & Recycling E-waste flows, resource recovery and improvement of legal framework in Pakistan. *Resour. Conserv. Recycl.* **2017**, *125*, 131–138.

30. Kessides, I.N. Chaos in power: Pakistan' s electricity crisis. *Energy Policy* **2013**, *55*, 271–285. [CrossRef]

31. Rehman, M. Pakistan's electricity generation has increased over time. So why do we still not have uninterrupted supply?—DAWN.COM. *Dawn*, 13 May 2019.

32. FDGP. *Pakistan Economic Survey 2017–2018*; Faculty of General Dental Practice: London, UK, 2018.

33. Bose, R.; Luo, X. Integrative framework for assessing firms' potential to undertake Green IT initiatives via virtualization—A theoretical perspective. *J. Strateg. Inf. Syst.* **2011**, *20*, 38–54. [CrossRef]

34. Coffey, P.; Tate, M.; Toland, J. Small business in a small country: Attitudes to 'Green' IT. *Carbon Footpr. Prod.* **2013**, *15*, 761–778. [CrossRef]

35. Molla, A.; Abareshi, A.; Cooper, V. Green IT beliefs and pro-environmental IT practices among IT professionals. *Inf. Technol. People* **2014**, *27*, 129–154. [CrossRef]

36. Koo, C.; Chung, N. Examining the eco-technological knowledge of Smart Green IT adoption behavior: A self-determination perspective. *Technol. Forecast. Soc. Chang.* **2014**, *88*, 140–155. [CrossRef]

37. Yoon, C. Extending the TAM for Green IT: A Normative. *Comput. Human Behav.* **2018**, *83*, 129–139. [CrossRef]

38. Molla, A.; Abareshi, A. Organizational green motivations for information technology: Empirical study. *J. Comput. Inf. Syst.* **2012**, *52*, 92–102.

39. Wen, T.; Noor, N.A.M. What affects Malaysian consumers' intention to purchase hybrid car? *Asian Soc. Sci.* **2015**, *11*, 52–63.

40. Solaiman, M.; Halim, M.S.A.; Manaf, A.H.A.; Noor, N.A.M.; Noor, I.M.; Rana, S.S. Consumption Values and Green Purchase Behaviour an Empirical Study. *Int. Bus. Manag.* **2017**, *11*, 1223–1233.

41. Sheth, J.N.; Newman, B.I.; Gross, B.L. Why We Buy What We Buy: A Theory of Consumption Values. *J. Bus. Ethics* **1991**, *22*, 159–170. [CrossRef]

42. Wier, M.; Doherty, K.O.; Laura, M.; Millock, K. The character of demand in mature organic food markets: Great Britain and Denmark compared. *Food Policy* **2008**, *33*, 406–421. [CrossRef]

43. Biswas, A.; Roy, M. Green products: An exploratory study on the consumer behaviour in emerging economies of the East. *J. Clean. Prod.* **2015**, *87*, 463–468. [CrossRef]

44. Biswas, A. A consumption value-gap analysis for sustainable consumption. *Environ. Sci. Pollut. Res.* **2017**, *24*, 7714–7725. [CrossRef]

45. Rahnama, H. Effect of Consumption Values on Women's Choice Behavior Toward Organic Foods: The Case of Organic Yogurt in Iran. *J. Food Prod. Mark.* **2017**, *23*, 144–166. [CrossRef]

46. Rahnama, H.; Rajabpour, S. Identifying effective factors on consumers' choice behavior toward green products: The case of Tehran, the capital of Iran. *Environ. Sci. Pollut. Res.* **2017**, *24*, 911–925. [CrossRef]

47. Khan, S.N.; Mohsin, M. The power of emotional value: Exploring the effects of values on green product consumer choice behavior. *J. Clean. Prod.* **2017**, *150*, 65–74. [CrossRef]

48. Harizan, S.H.M.; Rahman, W.A.W.A. Spirituality of Green Purchase Behavior: Does Religious Segmentation Matter? *J. Res. Mark.* **2017**, *6*, 473–484.

49. Khan, M.N.; Kirmani, M.D. Role of religiosity in purchase of green products by Muslim students: Empirical evidences from India. *J. Islam. Mark.* **2018**, *9*, 504–526. [CrossRef]

50. Ghazali, E.M.; Mutum, D.S.; Ariswibowo, N. Impact of religious values and habit on an extended green purchase behaviour model. *Int. J. Consum. Stud.* **2018**, *42*, 639–654. [CrossRef]

51. Islam, T.; Chandrasekaran, U. Religiosity and Ecologically Conscious Consumption Behaviour. *Asian J. Bus. Res.* **2015**, *5*, 18–30. [CrossRef]

52. Islam, T.; Chandrasekaran, U. Effect of religiosity on ecologically conscious consumption behaviour. *Asian J. Islamic Mark.* **2016**, *7*, 495–507. [CrossRef]

53. Hassan, S.H. The role of Islamic values on green purchase intention. *J. Islam. Mark.* **2014**, *5*, 379–395. [CrossRef]

54. Safiek, M. The effect of religiosity on shopping orientation: An exploratory study in Malaysia. *J. Am. Acad. Bus.* **2006**, *9*, 64–74.

55. Murugesan, S.; Gangadharan, G.R.; Computing, G. Harnessing Green It: Principles and Practices. *IT Prof.* **2008**, *10*, 24–33. [CrossRef]

56. Ikhlayel, M. An Integrative Approach to Develop E-Waste Management Systems for Developing Countries. *J. Clean. Prod.* **2018**, *170*, 119–130. [CrossRef]

57. Murugesan, S. Making IT Green. *IT Prof.* **2010**, *12*, 4–5. [CrossRef]

58. Hostager, T.J.; Neil, T.C.; Decker, R.L.; Lorentz, R.D. Seeing environmental opportunities: Effects of intrapreneurial ability, efficacy, motivation and desirability. *J. Organ. Change Manag.* **1998**, *11*, 11–25. [CrossRef]

59. Mithas, S.; Khuntia, J.; Roy, P.K. Green Information Technology, Energy Efficiency, and Profits: Evidence from an Emerging Economy. In Proceedings of the 31st ICIS, Saint Louis, MI, USA, 12–15 December 2010.

60. Butler, T. Compliance with institutional imperatives on environmental sustainability: Building theory on the role of Green IS. *J. Strateg. Inf. Syst.* **2011**, *20*, 6–26. [CrossRef]

61. Dalvi-Esfahani, M.; Shahbazi, H.; Nilashi, M. Moderating Effects of Demographics on Green Information System Adoption. *Int. J. Innov. Technol. Manag.* **2019**, *16*, 1950008. [CrossRef]

62. Liang, H.; Saraf, N.; Hu, Q.; Xue, Y. Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Q.* **2007**, *31*, 59–87. [CrossRef]

63. Biswas, A.; Roy, M. Leveraging factors for sustained green consumption behavior based on consumption value perceptions: Testing the structural model. *J. Clean. Prod.* **2015**, *95*, 332–340. [CrossRef]

64. Gonçalves, H.M.; Lourenço, T.F.; Silva, G.M. Green buying behavior and the theory of consumption values: A fuzzy-set approach. *J. Bus. Res.* **2016**, *69*, 1484–1491. [CrossRef]

65. Wang, H.; Han, X.; Kuang, D.; Hu, Z. The influence factors on young consumers' green purchase behavior: Perspective based on theory of consumption value. In Proceedings of the 2018 Portland International Conference on Management of Engineering and Technology (PICMET), Honolulu, HI, USA, 19–23 August 2018; pp. 1–5.

66. Lin, P.C.; Huang, Y.H. The influence factors on choice behavior regarding green products based on the theory of consumption values. *J. Clean. Prod.* **2012**, *22*, 11–18. [CrossRef]

67. Suki, N.M.; Suki, N.M. Consumption values and consumer environmental concern regarding green products. *Int. J. Sustain. Dev. World Ecol.* **2015**, *22*, 269–278. [CrossRef]

68. Ritter, Á.M.; Borchardt, M.; Vaccaro, G.L.R.; Pereira, G.M.; Almeida, F. Motivations for promoting the consumption of green products in an emerging country: Exploring attitudes of Brazilian consumers. *J. Clean. Prod.* **2015**, *106*, 507–520. [CrossRef]

69. Tsay, Y.Y. The Impacts of Economic Crisis on Green Consumption in Taiwan. In Proceedings of the PICMET'09-2009 Portland International Conference on Management of Engineering & Technology, Portland, OR, USA, 2–6 August 2009; pp. 2367–2374.

70. Finch, J.E. The Impact of Personal Consumption Values and Beliefs on Organic Food Purchase Behavior. *J. Food Prod. Mark.* **2006**, *11*, 3–20. [CrossRef]

71. Kumar, P.; Ghodeswar, B.M. Factors affecting consumers' green product purchase decisions. *Mark. Intell. Plan.* **2015**, *33*, 330–347. [CrossRef]

72. Suki, N.M.; Suki, N.M. Consumer environmental concern and green product purchase in Malaysia: Structural effects of consumption values. *J. Clean. Prod.* **2015**, *132*, 204–214. [CrossRef]

73. Ginsberg, J.M.; Bloom, P.N. Choosing the right green marketing strategy. *MIT Sloan Manag. Rev.* **2004**, *46*, 79–84.

74. Maniatis, P. Investigating factors influencing consumer decision-making while choosing green products. *J. Clean. Prod.* **2016**, *132*, 215–228. [CrossRef]

75. Lin, P.C.; Huang, Y.H.; Wang, J. Applying the Theory of Consumption Values to Choose Behavior toward Green Products. In Proceedings of the 5th IEEE International Conference on Management, Innovation and Technology ICMIT2010, Singapore, 2–5 June 2010; pp. 348–353.

76. Penz, E.; Stöttinger, B. A comparison of the emotional and motivational aspects in the purchase of luxury products versus counterfeits. *J. Brand Manag.* **2012**, *19*, 581–594. [CrossRef]

77. Kilbourne, W.; Pickett, G. How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *J. Bus. Res.* **2008**, *61*, 885–893. [CrossRef]

78. Kanchanapibul, M.; Lacka, E.; Wang, X.; Chan, H.K. An empirical investigation of green purchase behaviour among the young generation. *J. Clean. Prod.* **2014**, *66*, 528–536. [CrossRef]

79. Suki, N.M.; Suki, N.M. Impact of Consumption Values on Consumer Environmental Concern Regarding Green Products: Comparing Light, Average, and Heavy Users. *Int. J. Econ. Financ.* **2015**, *5*, 92–97.

80. Belk, R.W. An Exploratory Assessment of Situational Effects in Buyer Behavior. *J. Mark. Res.* **1974**, *11*, 156–163. [CrossRef]

81. Gadenne, D.; Sharma, B.; Kerr, D.; Smith, T. The influence of consumers' environmental beliefs and attitudes on energy saving behaviours. *Energy Policy* **2011**, *39*, 7684–7694. [CrossRef]

82. Saxena, R.P.; Khandelwal, P.K. Questnr-Can Green Marketing be used as a tool for Sustainable Growth: A Study Performed on Consumers in India- An Emerging Economy. *Int. J. Environ. Cult. Econ. Soc. Sustain.* **2010**, *6*, 277–291.

83. Essoo, N.; Dibb, S. Religious Influences on Shopping Behaviour: An Exploratory Study. *J. Mark. Manag.* **2004**, *20*, 683–712. [CrossRef]

84. Wilkes, R.E.; Burnett, J.J.; Howell, R.D. On the meaning and measurement of religiosity in consumer research. *J. Acad. Mark. Sci.* **1986**, *14*, 47–56. [CrossRef]

85. Arbuckle, M.B.; Konisky, D.M. The Role of Religion in Environmental Attitudes. *Soc. Sci. Q.* **2015**, *96*, 1244–1263. [CrossRef]

86. Razzaq, A.; Ansari, N.Y.; Razzaq, Z.; Awan, H.M. The Impact of Fashion Involvement and Pro-Environmental Attitude on Sustainable Clothing Consumption: The Moderating Role of Islamic Religiosity. *SAGE Open* **2018**, *8*. [CrossRef]

87. Farrag, D.A.; Hassan, M. The influence of religiosity on Egyptian Muslim youths' attitude towards fashion. *J. Islam. Mark.* **2015**, *6*, 95–108. [CrossRef]

88. Felix, R.; Braunsberger, K. I believe therefore I care: The relationship between religiosity, environmental attitudes, and green product purchase in Mexico. *Int. Mark. Rev.* **2016**, *33*, 137–155. [CrossRef]

89. Siyavooshi, M.; Foroozanfar, A.; Sharifi, Y. Effect of Islamic values on green purchasing behavior. *J. Islam. Mark.* **2019**, *10*, 125–137. [CrossRef]

90. Rehman, A.; Shabbir, M.S. The relationship between religiosity and new product adoption. *J. Islam. Mark.* **2010**, *1*, 63–69. [CrossRef]

91. Ansari, Z.A. The Relationship between Religiosity and New Product Adoption among Muslim Consumers. *Int. J. Manag. Sci.* **2014**, *2*, 249–259.

92. Baig, A.K.; Baig, U.K. The Effects of Religiosity on New Product Adoption. *Int. J. Res. Bus. Soc. Sci.* **2013**, *2*, 28. [CrossRef]

93. Jamal, A. Marketing in a multicultural world. *Eur. J. Mark.* **2003**, *37*, 1599–1620. [CrossRef]

94. Delener, N. The effects of religious factors on perceived risk in durable goods purchase decisions. *J. Consum. Mark.* **1990**, *7*, 27–38. [CrossRef]

95. Fam, K.S.; Waller, D.S.; Erdogan, B.Z. The influence of religion on attitudes towards the advertising of controversial products. *Eur. J. Mark.* **2004**, *38*, 537–555.

96. Pew Research Center. *The Changing Global Religious Landscape: Babies Born to Muslims Will Begin to Outnumber Christian Births by 2035*; Pew Research Center: Washington, DC, USA, 2017.

97. Huaibin, S.Y.L. Branding Pakistan as a 'Sufi' country: The role of religion in developing a nation's brand. *J. Place Manag. Dev.* **2014**, *7*, 90–104.

98. Nguyen, T.N.; Lobo, A.; Greenland, S. Pro-environmental purchase behaviour: The role of consumers' biospheric values. *J. Retail. Consum. Serv.* **2016**, *33*, 98–108. [CrossRef]

99. Plante, T.G.; Boccaccini, M.T. The Santa Clara Strength of Religious Faith Questionnaire. *Pastor. Psychol.* **1997**, *45*, 375–376. [CrossRef]

100. Calder, B.J.; Phillips, L.W.; Tybout, A.M. Designing Research for Application. *J. Consum. Res.* **2002**, *8*, 197. [CrossRef]

101. Issock, P.B.I.; Mpinganjira, M.; Roberts-Lombard, M. Drivers of consumer attention to mandatory energy-efficiency labels affixed to home appliances: An emerging market perspective. *J. Clean. Prod.* **2018**, *204*, 672–684. [CrossRef]

102. Adil, A. Our middle class | Opinion | thenews.com.pk | Karachi. *THE NEWS*, 15 June 2017. Available online: https://www.thenews.com.pk/print/210660-Our-middle-class(accessed on 25 April 2019).

103. Comrey, A.L.; Lee, H.B. *A First Course in Factor Analysis*, 2nd ed.; Lawrence Erlbaum Associates, Inc: Hillsdale, NJ, USA, 1992.

104. Nulty, D.D. The adequacy of response rates to online and paper surveys: What can be done? *Assess. Eval. High. Educ.* **2008**, *33*, 301–314. [CrossRef]

105. Ringle, C.; Wende, S.; Becker, J.-M. *SmartPLS 3*; SmartPLS GmbH: Boenningstedt, Germany, 2015.

106. Osborne, J. Improving your data transformations: Applying Box-Cox transformations as a best practice. *Pract. Assessment, Res. Eval.* **2010**, *15*, 1–9.

107. Anderson, J.C.; Gerbing, D.W. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychlogical. Bull.* **1988**, *103*, 411–423. [CrossRef]

108. Hair, J.F.; Ringle, C.M.; Sarstedt, M. PLS-SEM: Indeed a Silver Bullet. *J. Mark. Theory Pract.* **2011**, *19*, 37–41. [CrossRef]

109. Hair, J.F.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *Eur. Bus. Rev.* **2014**, *26*, 106–121. [CrossRef]

110. Hair, J.F., Jr.; Hult, G.T.M.; Ringle, C.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 2nd ed.; SAGE Publications: Thousand Oaks, CA, USA, 2016.

111. Fornell, C.; Larcker, D.F. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J. Mark. Res.* **1981**, *18*, 39–50. [CrossRef]

112. Diamantopoulos, A.; Siguaw, J.A. Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *Br. J. Manag.* **2006**, *17*, 263–282. [CrossRef]

113. Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed.; ERLBAUM: New York, NY, USA, 1988.

114. Hervé, C.; Mullet, E. Age and factors influencing consumer behaviour. *Int. J. Consum. Stud.* **2009**, *33*, 302–308. [CrossRef]

115. Hofstede, G. *Cultures and Organizations: Software of the Mind*; McGraw-Hill: London, UK, 1991.

116. Rahnama, H.; Rajabpour, S. Factors for consumer choice of dairy products in Iran. *Appetite* **2017**, *111*, 46–55. [CrossRef] [PubMed]

117. Pew research Center. Event: The Future of World Religions | Pew Research Center. 2015. Available online: http://www.pewforum.org/2015/04/23/live-event-the-future-of-world-religions/ (accessed on 14 March 2019).

118. UNEP and Basel Convention. *The Basel Convention on the Control of Transboundary Movements of Hazardous*; UNEP and Basel Convention: Basel, Switzerland, 2014.