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GIT: a consumer approach

The effects of knowledge, Belief and Enviournmentall concern on
attitude towards Green IT

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Dissertation

presented as partial requirement for obtaining the Master Degree Program in Data Science and Advanced Analytics

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

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GREEN IT: A CONSUMER APPROACH

by

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Dissertation presented as partial requirement for obtaining the Master's degree in Advanced Analytics,
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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledge the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisbon, 8th of November 2022

DEDICATION

This dissertation is dedicated to my parents, without them I could have never gotten to where I am today.

They gave me everything I could have ever asked for and more.

Thank you for everything.

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A special thank you to professor Mijail for supporting me since day one. None of this work would have been possible without him.

ABSTRACT

With the development of IT over the past two decades IT consumption has become more prevalent among developed countries. This consumption has led also to an increase in electricity consumption and waste generated by these products. Green IT is one of the solutions for this ever-growing consumption. Most of the studies developed around Green IT have taken a corporate approach, targeting mostly its IT, employees. Despite the importance of corporate carbon footprint reduction, a consumer-centric approach should also be taken. The objective of this study is to explore the potential factors that would lead to the adoption of Green IT, specifically the intention to purchase and use. For this purpose, we deployed a questionnaire in which a sample of 183 respondents was collected from the ages of 18 to 68 years old. To analyze this data we used the Partial Least Square Structural Equation Modelling through the SmartPLS software. From the estimated model show no statistical evidence that Price expectancy and social influence aren't determining factors when it comes to predicting consumer behavior, but Green IT knowledge and belief, habit Environmental concern, and performance expectancy are greatly associated with the intention to adopt Green IT. The result differs sometimes greatly from what has been observed in a corporate environment, Green IT belief is a greater factor when it comes to intentions to adopt it and social influence seems to have little to no impact on consumer decisions. The model estimated shows that there is interest and intention to adopt Green IT and it helps understand the consumer intentions towards Green IT products, painting a landscape for more sustainable IT products going forward.

KEYWORDS

Belief Action Outcome; Theory of Planned Behavior; UTAUT2; Green IT; Consumers

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LIST OF ABBREVIATIONS AND ACRONYMS

GIT	An abbreviation of Green IT
IT	An abbreviation for Information Technology
BAO	Belief action Outcome, this abbreviation is used when talking about the Belief action Outcome Framework
UTAUT2	Unified Theory of Acceptance and Use of Technology
TPB	Theory of planned behavior

1. INTRODUCTION

Environmental concerns have been on the rise especially in recent years, with the increasing resource constraints and environmental pollution these problems have attracted increasing attention from academics, policymakers, and consumers alike. Studies have confirmed that one of the biggest issues are unreasonable consumption habits and patterns being one of the most influential factors for the environment and causing nearly 40% of environmental degradation (Kranz & Picot, 2011). Green IT is most defined as the practice of environmentally sustainable computing (Ojo et al., 2019). The rise in IT usage not only present in most of day-to-day life but also in areas like business have drawn more attention to the positive and negative effects of IT. The most recognized negative impacts are mostly tied to the waste produced by IT and the resources needed to keep these developments working, whilst the positive effects are mostly tied to the greener practices in IT that contribute to sustainability environmental protection, and natural resource conservation.

Despite several worldwide policies, consumer energy household consumption continues to grow (Aydin & Brounen, 2019). Households in the European Union have a big weight on the increasing energy consumption, with values reaching 26% for lighting and 14.1% for appliances in 2019 (*The Future Carbon Footprint of the ICT and E&M Sectors*, 2018). The IT sector's carbon footprint represents about 1.4% of the global emissions (800 twhs), from these 800 twhs nearly half pertain to user devices (400 twhs) (*The Future Carbon Footprint of the ICT and E&M Sectors*, 2018). Studies suggest that these values will continue to grow exponentially (Mihai et al., 2019), however, this growth can be stopped by the adoption of more energy-efficient devices that limit energy usage. This is the main ambition of Green IT when it comes to the consumer, to educate and incentivize more power-efficient devices to reduce the carbon footprint of users.

Most of the research on Green IT has been focused on organizations, having as respondents the IT professionals of said companies. This view is extremely one-sided since it only considers the companies as consumers of IT and despite playing a big part in IT consumption the role of the individual, the consumer, should be taken into consideration (Molla et al., 2014; Ojo et al., 2019). This approach needs to take several steps, including understanding the consumer, and grasping their feelings and concerns to later understand and predict their attitudes.

This demands the investigation of Green IT's characteristics are enough to persuade users to transition to more environmentally friendly purchases when it comes to IT devices. (Ojo et al., 2019). Green IT development and attributes can influence a consumer's behavior towards a Product or service. Therefore, the purpose of this study is to realize what those attributes can be, product attributes, societal pressure, or even consumer beliefs and knowledge.

This research falls in line with what has been discovered about what is called e-waste. This waste has been increasing throughout the years as newer technologies arise and the old ones become obsolete (Mihai et al., 2019; Vermeşan et al., 2020). This waste has not been properly disposed of and much of it has been accumulating in dump sites in less developed countries (Maes & Preston-Whyte, 2022), making it a global problem, and calling for long-term solutions. Green IT can be part of those solutions.

This dissertation is divided into a total of seven sections. The next section will be focusing on Green IT, a bit of the studies it has been a topic in what theories and frameworks were developed, and the frameworks used to develop the model for this study. The third section is pertaining to the questionnaire and the sample collected for this study. The fourth section will be focusing on the statistical analysis and theoretical and practical implications of this study. The fifth and sixth chapters

will be the concluding chapters, detailing the main conclusions of the study and future recommendations and limitations respectively.

Table 1-Most influential studies

AUTHOR	PAPER	FINDINGS
VENKATESH ET AL.	Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology	This paper extends the already existing UTAUT model incorporating new concepts, therefore it can be seen as the creation of the UTAUT2 model
BUBA E IBRAHIM	Behavioral Model for Decision-Makers' towards the Intention to Adopt Green Information Technology: A Preliminary Study	Utilizing two different architectures, the Theory of planned behavior and the Norma activation model, this study proves their usefulness when studying the intentions to adopt Green IT
OJO ET AL.	Toward green computing practices: A Malaysian study of green belief and attitude among Information Technology professionals	This study incorporates the BAO architecture in the study of Green IT among IT professionals, it proves that this architecture is successful in studying these phenomena in a corporate environment
SCHMIDT ET AL.	INFLUENCE OF GREEN IT ON CONSUMERS' BUYING BEHAVIOUR OF PERSONAL COMPUTERS: IMPLICATIONS FROM A CONJOINT ANALYSIS	This study applies the concepts of Green IT in a consumer environment when it comes to the purchase of a personal computer, it proves the importance of the consumer view on the topic and calls to action further study of this topic
PALAU-SAUMELL ET AL.	User Acceptance of Mobile Apps for Restaurants: An Expanded and Extended UTAUT-2	This paper studies the user acceptance of new technology, in this case, mobile apps for restaurants. It proves that the UTAUT2 architecture is extremely successful when studying new technologies in a consumer-centric way

2. LITERATURE REVIEW

Most of the literature surrounding Green IT references it as a Business centered phenomenon and has been thoroughly studied. Although the IT-related carbon footprint made by businesses is large (and a problem that needs to be addressed) it is insufficient to study the relevance of Green IT from a one-sided viewpoint (Schmidt et al., 2010). The consumer carbon footprint is also a growing issue and a necessary one that needs to be studied. With the rise in household electricity consumption (Jens Malmödin Dag Lundén)(*The Future Carbon Footprint of the ICT and E&M Sectors*, 2018) and the increase in usage of IT devices, consumers have started adopting what is defined as “Green IT” to decrease their consumption in electricity and IT related resources (Kranz & Picot, 2011). This behavior has been studied and proven to be a rising trend and one essential to limit the negative consequences of the rapid growth in electricity consumption (Kranz & Picot, 2011).

Recent studies have shown the importance of Green IT knowledge, Belief, Attitude, and societal influence on Green IT behavior (Molla et al., 2014). These factors are detrimental to the adoption of Green IT in a professional environment, therefore they need to be studied with a consumer-centered approach.

When it comes to the adoption of new technologies, three factors are relevant: Performance expectancy (Palau-Saumell et al., 2019), Habit (Limayem et al., 2007), and price value (Palau-Saumell et al., 2019). These factors are used in studies employing the UTAUT2 framework which is related to the study of behavior toward the adoption of new technologies. Whilst not a new technology, Green IT can be classified as a new way of approaching already existing products, justifying the study of these three factors that impact the way that the consumer perceives Green IT products.

Other studies have posed and proved the importance of Environmental concern as a factor that influences the consumers' attitude towards GIT, as seen in (Buba & Ibrahim, 2021) who show the extreme importance of this factor in decision-makers, in this case consumers, intention to adopt Green IT.

2.1. BELIEF-ACTION-OUTCOME (BAO)

The BAO model was originally conceptualized by (Melville, 2010), and consists of studying the importance of IS in shaping beliefs in the environment, enabling greener practices within organizations.

The BAO framework was in itself an adaptation and extension of Coleman's Models of social and individual relations (Coleman, 1986) (Figure 1) and information systems. (Ojo et al., 2019) further adapted the BAO model, developing a study which highlights the importance of GIT yet again in an organizational context. Further extending the model proposed by (Melville, 2010), (Ojo et al., 2019) propose that GIT beliefs are influenced by three main factors: personal awareness, management support, and social influence.

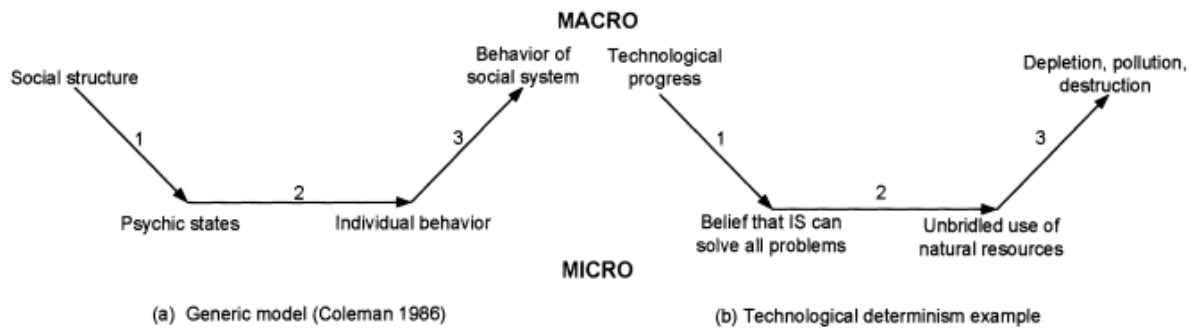


Figure 1– Coleman’s model of Social and Individual Relations

As mentioned, the original model proposed by (Melville, 2010) is an adaptation of Coleman’s model (Coleman, 1986). This architecture provides a way of posing research questions, intersecting IS with environmental sustainability in organizations. Both models use Macro and Micro level variables, which have different purposes. Micro-level variables investigate the small-scale interaction between individuals, such as conversations or group dynamics. Macro-level variables, on the other hand, are used for the study of large-scale social progress, such as stability and societal change (Davidsson & Wiklund, 2007).

The first construct in the BAOs framework is Belief formation. This refers to how beliefs, desires, and opportunities about the natural environment are formed. It has 3 main sub-constructs: Societal structure, Individual Beliefs, and Organizational structure. Societal structure is considered to be a Macro factor being defined as “Cultural or normative patterns that define expectations of agents about each other’s behavior and that organize enduring interrelationships” (López & Scott, 2000). Organizational structure refers to how an organization divides its labor into different tasks, achieving coordination between them. The last one Individual belief, a Micro level construct refers to the state of mind of an individual, his internal beliefs desires, and opportunities.

The second element in the model is Action formation, defining how mental states about the environment and its state translate into actions, such as an adoption of a new information system in order to aid with organizational recycling (Melville, 2010). This element serves as a Micro level connector between the other two elements and their micro-level constructs.

The final element of the BAO framework is Outcome formation, analyzing how the actions taken affect social and organizational systems. It is comprised of three main sub-constructs: Behavior of social system, Individual actions, and the Behavior of the Organization. The first one is a Macro level concept and refers to the functioning of the society and its behavior when it comes to the action outcome. The behavior of the organization, a Macro level concept refers to the functioning and behavior of the organization after the actions. The third one, Individual actions, is a Micro level concept that represents the action an individual takes and how it affects them.

As mentioned, both models have been used in more business-centric approaches, having into consideration factors such as Managerial Culture and Organizational structure. In the context of this study, such factors are not considered seeing as they mostly relate to an organizational approach.

Taking this into account, part of the architecture was adapted to test if these hypotheses which were already proven in the business-centric environment would be relevant in a consumer environment when it comes to their attitude towards GIT.

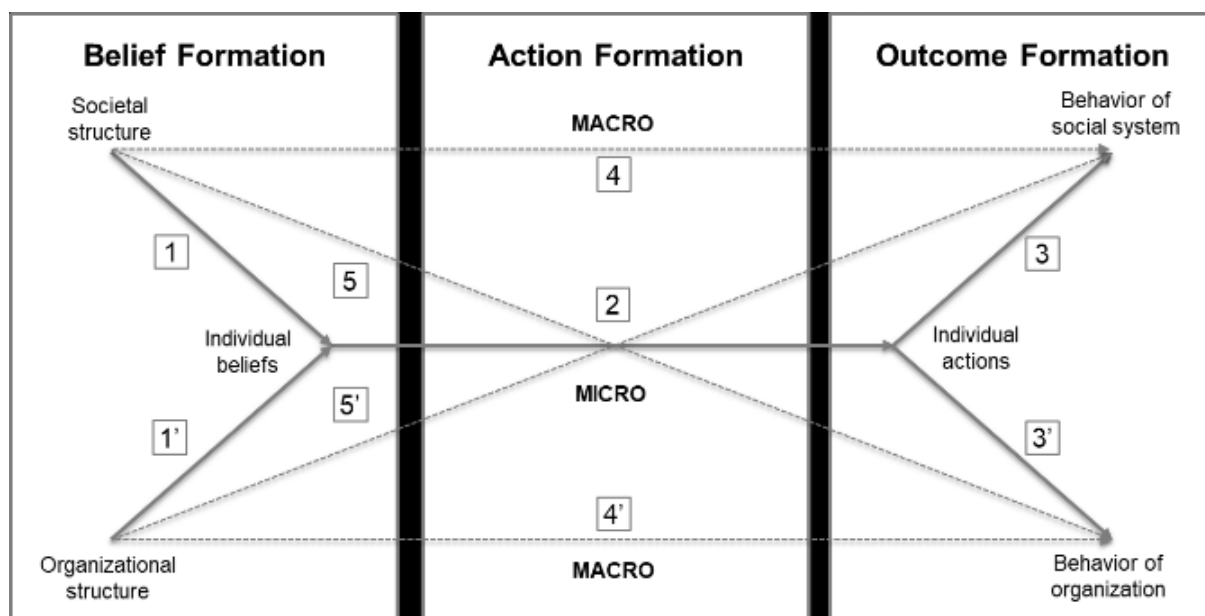


Figure 2-Belief Action Outcome Framework

Five main hypotheses were adapted from studies that have used this model. Two of them pertaining to the societal structure, two on individual beliefs, and one on individual actions.

GIT knowledge was the first individual belief adopted. This factor pertains to an individual's knowledge on Green IT, what it is, how it can be used, and what products can be classified as such. This factor has been studied from two different views influencing the user's attitude towards GIT directly and through the mediating effect of GIT belief.

According to (Fryxell & Lo, sem data), Environmental knowledge can be defined as "a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems", also according to (Koo & Chung, 2014) "Knowledge consists of what a person believes about the way the world works in general and in a specific context".

The acquisition and increase of pro-environmental knowledge can have a significant effect on environmentally friendly beliefs and attitudes. Besides influencing attitude directly studies have also posited the hypothesis that Green IT knowledge can have a direct effect on the attitude towards Green IT mediated by the IT user's GIT belief (Ojo et al., 2019).

Belief refers to the acceptance of a given fact by an individual at a given point without the need for proof. GIT belief has been defined as the user's perception and cognition about the effects of IT waste and usage on the environment (Molla et al., 2014). Based on their experience and education, users can deepen their knowledge about GIT enabling them to internalize green beliefs and attitudes (Subramanian et al., 2016).

According to (Ojo et al., 2019) an IT user's knowledge on GIT can create a strong feeling toward GIT since the user creates a deepened understanding of the relevance of GIT in addressing environmental issues. With this in mind, two hypotheses were created H3 which pertains to the effect of GIT knowledge on the user's GIT attitude, and H4 which pertains to the mediating effects of GIT belief towards the user's attitude towards GIT.

H1: A person's GIT knowledge directly influences their GIT belief

H2: A person's GIT knowledge is positively related to their attitude towards GIT

H3: A person's GIT knowledge is indirectly related to their attitude towards GIT through GIT belief

Social influence has been studied mainly under the guides of the Theory of planned behavior and the Theory of reasoned action, conceptualizing it as a subjective norm (Lewis et al., 2003). In these studies, Social influence is defined as the "perceived social pressure to perform or not perform the behavior" (Ajzen and Fishbein 1989). Another conceptualization, that emerged from the study of the adoption of communication technology, is the theory that leans on social networks as a diffusion engine on the opinion of technology. This means that an individual's perception of a specific technology is heavily influenced by his social network.

Social influence has been shown to be very prominent in determining an individual's belief about the usefulness of a technology (Lewis et al., 2003; Ojo et al., 2019). Since an individual's actions can be shaped by their social circle, the people they most closely associate with, facilitate the creation of an environment which can influence their beliefs and attitudes (Koo & Chung, 2014). This construct has already been studied in the context of Green IT and has been shown to be able to become a strong factor in determining an individual's belief in Green IT and their attitudes (Ojo et al., 2019).

Therefore, we pose that Social influence can be a determining factor in Green IT attitude, not only as a direct effect but also an indirect effect through affecting an individual's Green IT belief, as seen in the following hypothesis:

H4: Social influence is positively related to consumer's attitude towards GIT.

2.2. UTAUT2

The UTAUT2 architecture was proposed by (Venkatesh et al., 2012) which itself is an extension of the Unified theory of acceptance and use of technology (UTAUT), proposed by the same author (Venkatesh et al., 2003), a theory used in the study of acceptance and usage of technology in a consumer context. The UTAUT model was used to explain critical factors and contingencies predicting the usage of a technology and its perceived behavioral intention mainly in organizational contexts.

After its inception the UTAUT architecture was adapted and used in many different studies creating new extensions of this theory, the author however believed that these extensions would not suffice in the study of factors that apply to a consumer technology use context.

The UTAUT2 model was built to better build and identify the additional constructs and relationships that could be integrated into the UTAUT architecture to tailor it for a more consumer-centric approach. With this purpose, three constructs were added to the existing model, Hedonic motivation, Price Value, and Experience and Habit.

The UTAUT2 model has many constructs, these being Performance expectancy, social influence, effort expectancy, facilitating conditions, Hedonic motivations, Price value, and Habit. The first four concepts were adapted from the original UTAUT architecture into the UTAUT2 architecture.

In the UTAUT2 model Performance expectancy is the degree to which the adoption of a new technology will bring benefits to its consumer in the performance of certain activities (Palau-Saumell et al., 2019, p. 2), Effort expectancy is the amount of effort that it will take to use this technology, Social influence is the degree to which a consumer thinks that people who are important to Him/Her believe that he should use this technology and Facilitating conditions is the degree to which a consumer believes that there are enough resources to help him with the maintenance and usage of a particular technology.

In the development of the UTAUT2 model, it was noted that the original UTAUT model has a very big emphasis on the importance of utilitarian value, the construct tied to this, performance expectancy has been noted as the strongest one in the prediction of behavioral intention (Venkatesh et al., 2003). To compliment, three constructs were added, Hedonic motivation, Price value, and Habit.

Hedonic motivation comes from its inclusion in consumer behavior research (Hirschman & Holbrook, 1982), a factor trying to explain intrinsic motivation from the consumer to accept and use new technology. In a consumer-centric view, price is also a big factor that affects the decision-making process, since it's the consumer's burden to purchase this new technology, therefore Price value was added as a construct since price has been observed to be a big factor when it comes to consumer actions (Dodds et al., 1991). UTAUT models have a big emphasis on the fact that intention has a big role in behavior. One very big factor that has been critical in the prediction of technology use is Habit (Kim & Malhotra, 2005). With this in mind, Habit was also added to the UTAUT2 architecture.

This theory has been present in many different studies mostly analyzing the acceptance and behavioral intention towards new technologies such as Online Gambling, m-commerce adoption (Salimon et al., sem data), and digital payment systems (Sivathanu, 2018).

Despite not being traditionally a new technology GIT is a new perspective and way of using already existing technology. Therefore, part of the UTAUT2 architecture was adapted into the proposed model, mainly the factors that are more relevant to Green IT, these being Performance Expectancy and Habit.

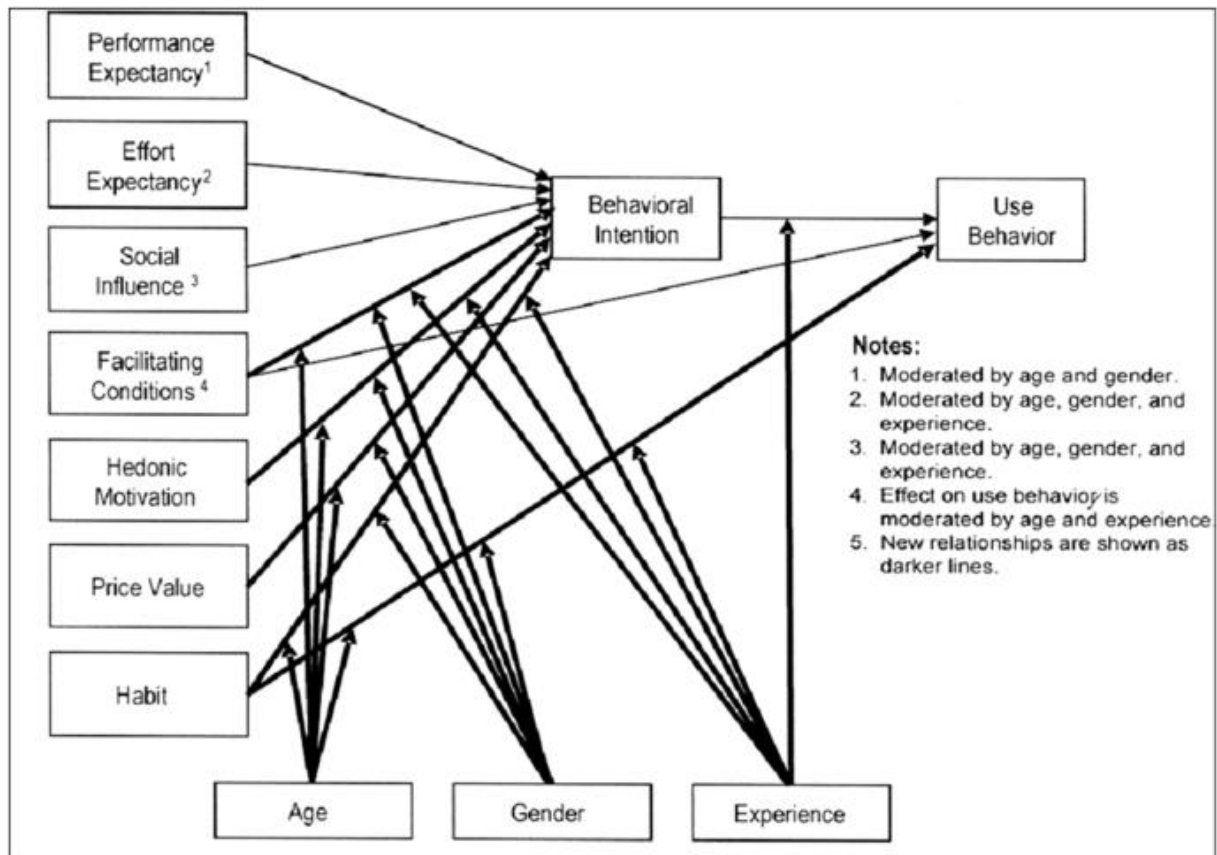


Figure 3-UTAUT2 framework

Upon adding these 2 constructs to the model 2 hypotheses were developed for each of them.

As defined by (Venkatesh et al., 2003) Performance expectancy is “the degree to which an individual believes that using the system will help him or her to attain gains in job performance”. A lot of studies have pointed out the importance of Performance expectancy when it comes to the acceptance and usage of different technologies (Sivathanu, 2018). In the case of GIT, the performance expectancy would be related to economic benefits, satisfaction, personal image, and convenience, factors that have been used to Analyze performance expectancy in the Behavioral intention towards other technologies.

Since this adaptation of the UTAUT2 constructs is not testing an acceptance of a new technology, but a new way of using one that already exists the performance expectancy construct was renamed to GIT perceived use.

H5: People's perceived use of GIT influences their attitude towards GIT

In the context of IT and IS habit is defined as “The extent to which people perform something automatically due to learning”, and has been proven to be an effective tool when it comes to explaining IT-related behaviors (Palau-Saumell et al., 2019). (Venkatesh et al., 2012) found two different but significant relationships when it comes to habit, Habit-intentions to use and habit-use, both of these being confirmed when it comes to the usage of IT(Escobar-Rodríguez & Carvajal-Trujillo, 2014).

When it comes to the study of IT habit has been shown to be a determining factor in the usage and acceptance of new technology.(Hew et al., 2015; Orso et al., 2017; Tai & Ku, 2013). Whilst not a new technology Green IT is the adoption of new way of consuming this existing technology.

Due to this habit is expected to be a crucial factor when it comes to Green IT attitude, so we pose the hypothesis that habit will have a direct effect on Green IT attitude.

H6: Habit influences People’s attitude towards GIT

2.3. THEORY OF PLANNED BEHAVIOR (TPB)

The theory of Planned Behavior originates from the Theory of Reasoned Action (Ajzen and Fishbein 1980). The TRA model suggests that actions are under volitional control, that the behavior that a person makes is a result of their intention to do a behavior. These intentions are a direct result of a person’s perceived behavioral control, attitudes, and subjective norms according to the TPB.

This theory has three main constructs attitude toward the behavior, subjective norms, and perceived behavioral control. The first construct attitude towards a behavior refers to the degree to which a person has a positive or negative attitude toward the behavior. The second construct, subjective norms refers to the individual perception that a person must pursue a behavior or not. The third construct is perceived behavioral control. This construct reflects a person’s past experiences and roadblocks that the person assumes it has since it refers to the perceived ease or difficulty that a person believes he has when performing a behavior. (Ajzen, 1991)

With regard to social and pro-environmental behavior, the TPB is considered one of the most influential and widely used theories. This pro-environmental behavior has been proven by (Armitage & Conner, 2001), validating the TPB in this context.

Besides its usage in the general pro-environmental context, this model has also proven to be effective in detecting a person’s intention to adopt Green IT. (Buba & Ibrahim, 2021) have used this model as a mediating factor between Environmental concern and the Intention to adopt Green IT, pairing it with the Norm Activation model, thus validating the usage of this model in studies addressing the intention to adopt Green IT.

In this study the TRA will be used also as a mediating factor between environmental concern and Green IT attitude, paring this model with the Belief-Action-Outcome and the UTAUT2 model.

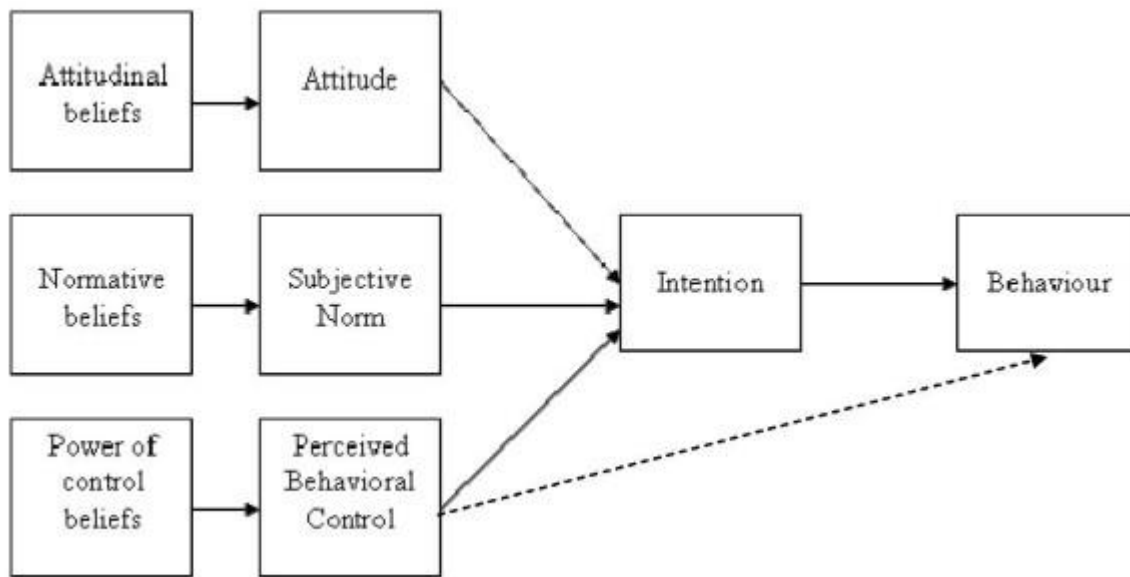


Figure 4-Theory of planned behavior Framework

From this architecture, only one construct was integrated into the model: Environmental concern.

According to (Zhang et al., 2019) Environmental concern is defined as “A universal perception or behavior that triggers an individual to engage in activities that adequately protect the environment”. This behavior is instrumental when it comes to influencing people’s behavior to become more environmentally friendly. This variable has been shown to be very detrimental when it comes to an intention to adopt more Green IT solutions (Buba & Ibrahim, 2021), (Zhang et al., 2019).

It was found that high levels of environmental activism or concern were strongly linked to a willingness to change and make sacrifices in order to slow down pollution (Gilg et al., 2005; Minton & Rose, 1997), to make individuals behave in a more environmentally friendly way. Also, by being aware of their actions and potential consequences, individuals tend to gravitate towards solutions brought on by individual choices (Lin & Huang, 2012).

Several studies in the past have found a positive correlation between Environmental concern and the intention to use green products (Lin & Huang, 2012). Therefore, environmental concern is a very strong cognitive factor to predict a consumer’s intention or attitude toward green products, in this case, Green IT.

Both empirical research point to the fact that Environmental Concern has a positive impact on people’s behavioral intentions to adopt Green IT. With these studies in mind this hypothesis was developed, where an individual with greater environmental concern is more likely to have a cheerful outlook and behavioral intention to adopt green IT.

H7: Environmental Concern will have a positive and significant influence on Green Attitude for behavioral intention to adopt Green-IT

Besides its direct impact on GIT attitude Environmental concern has also been found to have a direct effect on people's perceived use of Green technologies(Kilbourne & Pickett, 2008). This direct effect could be of interest to the model that we are proposing and so it was included to perceive if this effect is a significant one when it comes to Green IT.

H8: Environmental concern has a direct effect on people's perceived use on GIT

From the above-mentioned constructs the following conceptual framework was developed:

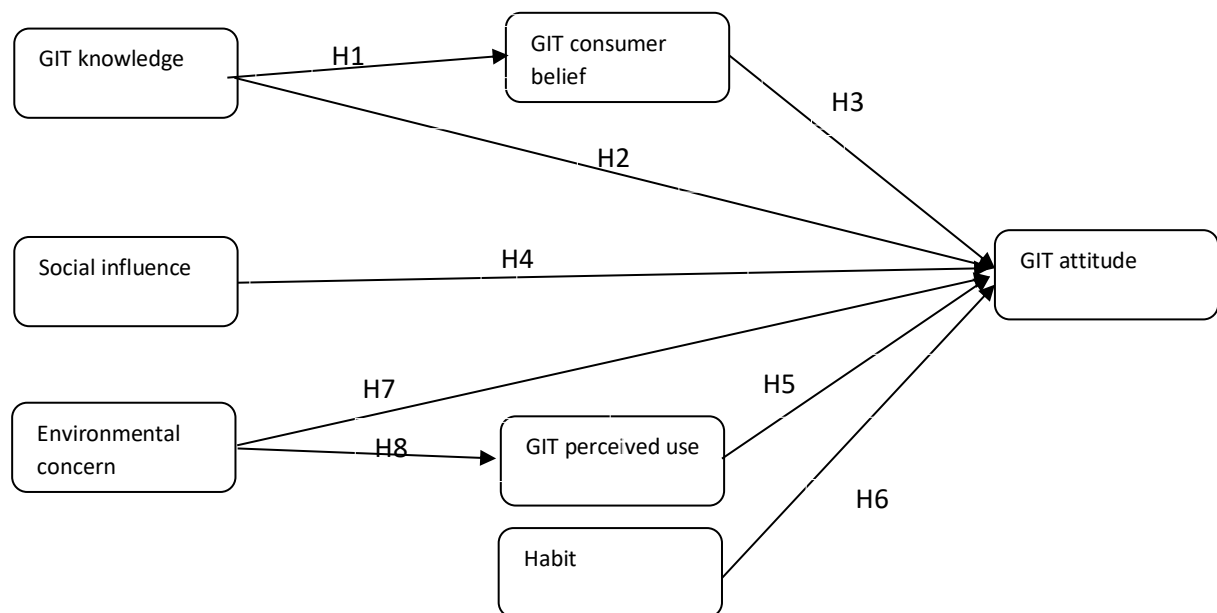


Figure 5- Proposed Model

3. METHODOLOGY

The target population of this study was Portuguese consumers aged 18 or more. This questionnaire was developed and employed using the Qualtrics platform. Most of the items used in this questionnaire were adapted from other studies, and as such the scales used for them. All of the items were measured on a 7-point scale, where a 1 means “completely disagree” and a 7 “completely agree”.

Most of the consumers were young adults aged 18 to 25 years old, pertaining to about 46% of the total population. Although this represents most of the population there was also another big group of individuals, the adults aged more than 41 years old, which represent about 31% of the population. There was an even distribution of the gender of the respondents. A summary of the demographic of the respondents can be seen in Table 2.

Table 2-- Respondent's demographic

	N	%
Gender		
Male	94	51,3%
Female	89	48,6%
Age		
18-25	89	48.6%
26-33	21	11.4%
33-41	14	7.6%
>41	59	32.2%

When it comes to Green IT practices, over half of the respondents (about 53.2%) admitted using their devices in an environmentally friendly way, e.g., turning off their devices when not using them and using the device's power-saving features in devices that are used regularly.

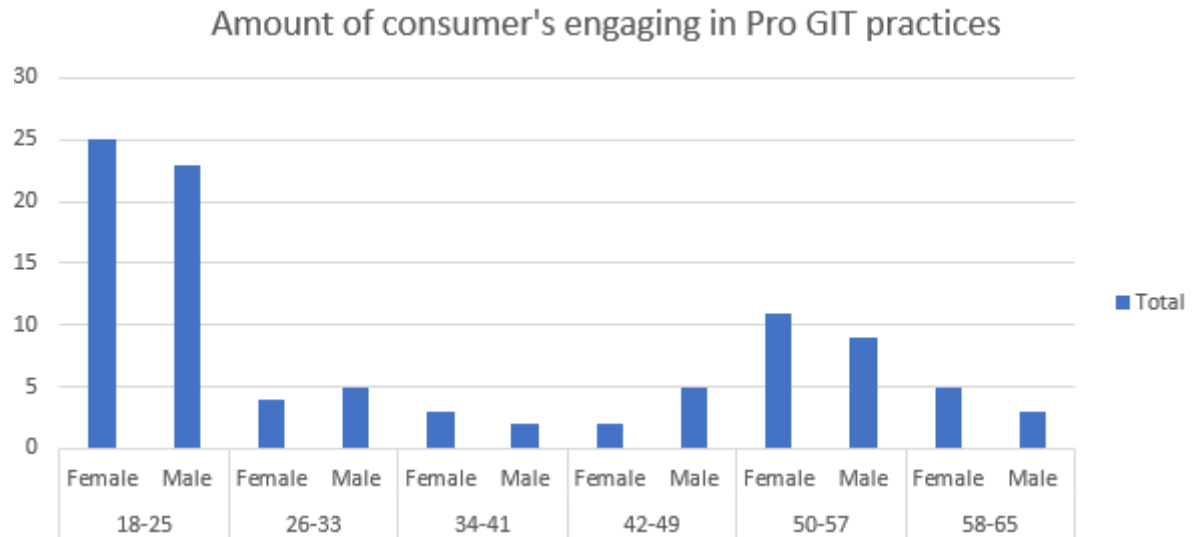


Figure 6-Amount of users engaging in Pro GIT practices

For the younger generation, it could be attributed to the fact that this generation is more embroiled in the digital transformation and innovation occurring in the IT market. When it comes to the older generation it has been studied that there is a positive correlation between age and pro-environmental behaviors(Wiernik et al., 2013). This study found that “Older individuals appeared to perform more behaviors that relate to active protection of ecosystems and avoidance of pollution and were more likely to engage in activities in the outdoors”. These findings can be linked to the distribution found in this study; older individuals seem to have a greater concern when it comes to acting in pro-environmental behaviors when it comes to IT.

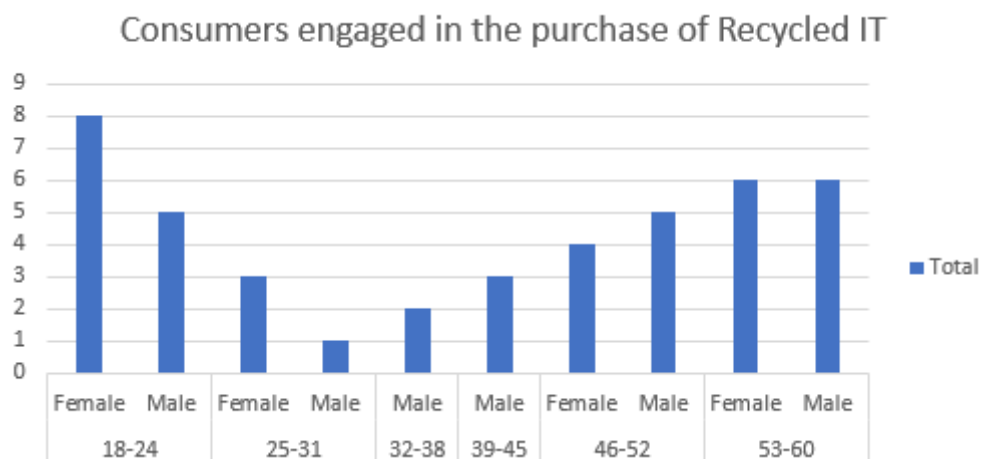


Figure 7-Amount of consumers engaged in the purchase of Recycled IT

The above point is reinforced when it comes to the purchase of recycled IT components. This time the distribution is even more skewed towards the older generation. This may be due to the fact that this generation, as studied by (Wiernik et al., 2013) is prone to take immediate action.

4. RESULTS AND DISCUSSION

4.1. MODEL ESTIMATION

To estimate the model the SmartPLS3 software was used.'

For the past years, the PLS-SEM has been used in several different areas as the go-to model estimation in several areas including organizational management, management information systems, and marketing management(Hair et al., 2019).

This technique estimates partial model structures by combing the analysis of main components with OLS regressions (Hair et al., 2019). This model estimation technique was chosen for several reasons the main ones being, a small sample with 183 respondents, a size that does not generate issues when estimating using this technique, and the fact that the model can be considered quite complex with several relationships and a high number of constructs.

To evaluate the internal consistency of the constructs, 3 main statistics were used: Cronbach's alpha, Composite reliability, and AVE (average variance extracted).

When it comes to Cronbach's alpha, the criterion for assessing internal reliability is a value above 0.6 and below 0.9. Every latent variable verified a CA belonging in this threshold. This measure, however, has been considered a less precise measure as the items it measures are unweighted(Hair et al., 2019). While the former is true, we will not use this measure isolated, meaning we will validate most variables using a combination of several measures. For example, other Composite reliability has been also widely used when it comes to the internal consistency of the model(Hair et al., 2019).

The Composite Reliability statistic of a construct should have values between 0.6 and 0.9. This was the case for all the items studied. Greater values could be problematic as these usually indicate that the items are redundant, or they could also trigger undesired inflated correlations.

Thirdly the AVE was analyzed. This measure evaluates a construct's convergent validity which is defined as the extent to which the construct converges to explain the variance of its items (Hair et al., 2019). The value of the AVE must be higher than 0.5 which means that the construct explains at least 50% of the variance of its items. This was the case for all the constructs.

Table 3-Indicators Measurements

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Attitude	0,900	0,906	0,924	0,670
Environmental concern	0,815	0,822	0,868	0,568
GIT_Consumer_Belief	0,853	0,863	0,901	0,696
GIT_Knowledge	0,612	0,618	0,837	0,720
GIT_Perceived_Usefulness	0,851	0,861	0,893	0,627
Habit	0,861	0,868	0,895	0,587
Social_Influence	0,919	0,935	0,939	0,755

After evaluating the internal consistency, the discriminant validity was next to evaluate it, 3 main statistics were used: Fornell-Larcker measure, the Heterotrait-Monotrait ratio of the correlations, and cross-loadings.

The discriminant validity consists of “the extent to which a construct is empirically distinct from other constructs in the structural model” (Hair et al., 2019). This measure, also called the Fornell-Larcker measure, shows that a construct has discriminant validity if the value of the square root of the AVE of a construct must be higher than the correlation between the other constructs which was the case for all of the constructs.

Table 4- Fornell-Larcker measure

	<i>Att</i>	<i>E_C</i>	<i>GIT_C_B</i>	<i>GIT_Kn_o</i>	<i>GIT_P_U</i>	<i>Habit</i>	<i>S_I</i>
Attitude	0.818						
Environmental concern	0.595	0.754					
GIT_Consumer_Belief	0.658	0.542	0.835				
GIT_Knowledge	0.599	0.481	0.547	0.848			
GIT_Perceived_Usefulness	0.716	0.579	0.667	0.611	0.792		
Habit	0.697	0.622	0.468	0.598	0.679	0.766	
Social_Influence	0.342	0.255	0.205	0.353	0.316	0.495	0.869

The HTMT or Heterotrait-Monotrait ratio of the correlations, also measuring the discriminant validity, is defined as “the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct”. This measure must have a value below 0.9 for discriminant validity to be proven which was also the case for all the constructs.

Table 5- Heterotrait-monotrait ratio HTMT

	<i>Att</i>	<i>E_C</i>	<i>GIT_C_B</i>	<i>GIT_Kno</i>	<i>GIT_P_U</i>	<i>Habit</i>	<i>S_I</i>
Attitude							
Environmental concern	0.654						
GIT_Consumer_Belief	0.749	0.610					
GIT_Knowledge	0.799	0.655	0.755				
GIT_Perceived_Usefulness	0.807	0.650	0.771	0.848			
Habit	0.769	0.689	0.518	0.797	0.771		
Social_Influence	0.367	0.277	0.235	0.472	0.349	0.579	

For discriminant validity to exist the cross-loadings of the attributes should also be analyzed. The values of each should not be higher than the loading of each indicator in the respective construct. This was the case for all the constructs.

Table 6- Loadings

	<i>ATT</i>	<i>EC</i>	<i>GIT_C_B</i>	<i>GIT_Kno</i>	<i>GIT_P_U</i>	<i>HA</i>	<i>SI</i>
<i>ATT_1</i>	0.830						
<i>ATT_2</i>	0.881						
<i>ATT_3</i>	0.849						
<i>ATT_4</i>	0.694						
<i>ATT_5</i>	0.785						
<i>ATT_6</i>	0.857						
<i>BLF_2</i>			0.726				
<i>BLF_3</i>			0.844				
<i>BLF_4</i>			0.894				
<i>BLF_5</i>			0.866				
<i>EC_1</i>		0.743					
<i>EC_2</i>		0.721					
<i>EC_3</i>		0.844					
<i>EC_7</i>		0.722					
<i>EC_8</i>		0.732					
<i>GIT_KNO_3</i>				0.827			
<i>GIT_KNO_5</i>				0.869			
<i>HA_1</i>						0.742	
<i>HA_2</i>						0.742	
<i>HA_3</i>						0.808	
<i>HA_5</i>						0.770	
<i>HA_6</i>						0.785	
<i>HA_7</i>						0.749	
<i>PE_1</i>					0.852		
<i>PE_2</i>					0.735		
<i>PE_3</i>					0.810		
<i>PE_5</i>					0.742		
<i>PE_7</i>					0.814		
<i>SI_1</i>							0.801
<i>SI_2</i>							0.896
<i>SI_3</i>							0.926
<i>SI_4</i>							0.898
<i>SI_5</i>							0.817

With these 3 final measures analyzed we can conclude that discriminant validity is present within the model so every existing construct is suitable for testing the structural model.

From the statistics above described, we can conclude that the model both has internal consistency and discriminant validity, so the structural analysis of the model was performed.

4.2. STRUCTURAL MODEL AND MULTI-GROUP ANALYSIS

By performing bootstrapping with 5000 samples, we can understand the significance of the path coefficients. The results obtained show that most of the hypotheses were accepted at a 5% significance level (except for H4 and H2) by analyzing their respective p-values.

The model was developed with all the observations in the dataset, explaining 65.5% of the variation in the intention to adopt Green IT, about 34% of the perceived use of GIT of the consumer's belief in GIT products 30%. The model explains a good amount of variance in its constructs, this shows us that the model is composed of constructs that are the main drivers of consumer attitude towards adopting Green IT products.

Most of the path coefficients were significant in this model except for the impact of social influence on consumer GIT attitude and the direct impact of GIT knowledge on GIT consumer attitude (with a $\beta = 0.005^{**}$ and $\beta = 0.09^{**}$ respectively), meaning that neither of these two direct relationships are significant.

However, it was observed that Environmental concern has a large Direct effect on GIT perceived use ($\beta = 0.58^{**}$), which itself has a direct effect on consumer attitude towards GIT products ($\beta = 0.226^{**}$), with this effect Both H1 and H6 are both supported through this framework. GIT knowledge was also observed to have a large direct effect on GIT consumer belief ($\beta = 0.547^{**}$), this consumer belief is also a large factor in determining consumer attitude ($\beta = 0.293^{**}$), therefore H3 and H9 are both supported. Habit was also observed as a factor that influences GIT attitude, having a large direct effect on it ($\beta = 0.35^{**}$), meaning that H7 is also supported.

Environmental concern was also found to have a direct effect on perceived GIT use leading to this variable having an R squared of 33.6% and a β equal to 0.58. This effect has been observed before. In a study by (Nanggong & Rahmatia, 2019) it was found that environmental concern, a personal value, contributes greatly in creating sustainable behavior. This factor has been observed also in a previous study addressing the impact Environmental concern has on consumerism/materialism (Kilbourne & Pickett, 2008). This study found that when a person's environmental concern increases so do their actions to improve the environment such as purchasing more environmentally friendly products, reducing waste, and buying organic products. What was found in this study falls in line with what was already observed in other studies where if a person is more environmentally conscious, more they will see the advantages in utilizing GIT as opposed to other products. So the H5 hypothesis is supported by the model.

Habit was also one factor that is observed to have a large direct effect on GIT attitude. Habit has been studied before and was found to have a significant direct effect on Pro-environmental intention among consumers (Chuang et al., 2018).

When it comes to Social influence, its direct impact on GIT attitude was not very significant ($\beta = 0.35^{**}$), with a p-value of 0.9 it was also not statistically significant. Unlike other studies developed around GIT, this study having a consumer-centric approach will have different results and different factor impact. Although the former is true there have also been cases where it was observed that Social influence does not have an impact on pro-environmental consumer behavioral intention (Chuang et al., 2018). This means that H3 is not supported in this model.

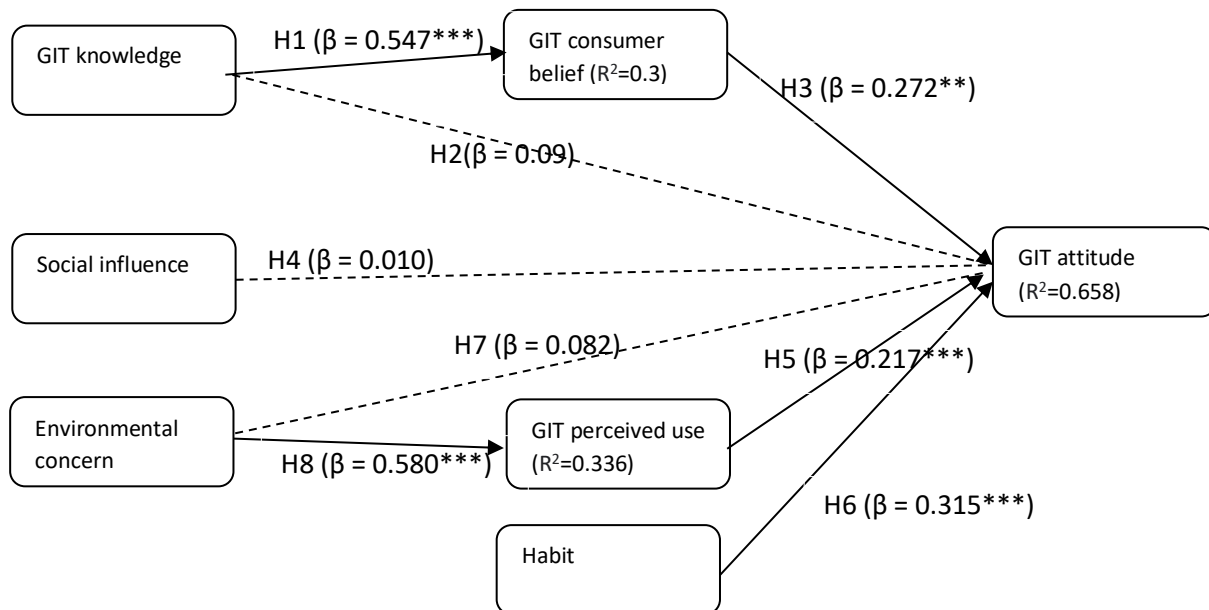


Figure 8-Final model (*** significant at $p < 0.01$, ** significant at $p < 0.05$, * significant at $p < 0.1$)

As per the inner VIF values, these being the measure that details the collinearity between constructs, there was no value greater than five. This means that there is no risk of multicollinearity between each independent variable.

5. DISCUSSION

The objective of this study was to find what are the main factors that affect consumers' intentions to adopt Green IT. The model that was developed used the Belief Action Outcome, UTAUT2, and Theory of Planning Behavior frameworks to do so. The BAO framework tries to find if the personal beliefs and knowledge of a person has a direct impact on intention, the UTAUT2 framework test if the product's qualities and personal choices have an impact on consumer intention and the TPB tries to access if personal values have an impact on consumer intention.

5.1. BELIEF ACTION OUTCOME

GIT knowledge

When it comes to GIT knowledge in this study it is not a strong predictor of attitude towards GIT, this is not in line with the literature, but it can be attributed to the fact that the respondents do not feel that only their knowledge of GIT can lead their attitude to change towards it. The respondents did not feel that they had not only enough knowledge about GT but also that they did not receive enough information about it (GIT_KNO_1 and GIT_KNO_6). The median response to these constructs was 3/7 and 2/7 respectively, therefore these indicators provided very little significance to the model and as such could not be used (0.53 and 0.36). One possible explanation for the difference felt in this study compared to others in the literature could be that this study has a less tech-savvy demographic, other studies conducted mainly focused on the business side of Green IT more specifically IT employees which tend to have a greater knowledge not only of IT but also about its alternatives (Molla et al., 2014; Ojo et al., 2019).

GIT belief

GIT belief had somewhat of a predictable but also unpredictable behavior when it came to predicting attitude. As seen in other studies GIT knowledge is a very significant predictor of GIT belief (Molla et al., 2014; Ojo et al., 2019). What was a different behavior was the degree of predictability that GIT knowledge has on belief and the fact that Git belief has also a greater effect on Attitude compared to other studies. These phenomena can be attributed to the fact that IT consumers feel that they do not possess the knowledge to act on but do believe that GIT is a correct step when it comes to reducing not only their carbon emissions but also reduce their consumption. This can be corroborated by the fact that almost all of the indicators pertaining to GIT Belief not only have very high median values (BLF_2 BLF3, BLF_4, and BLF_5 have median values between 5 and 6) but also almost all of them are statistically significant (with outer loading values ranging from 0.73 to 0.89). This greater belief also falls in line with what was discovered about GIT knowledge, since consumers do not think that they have enough information about it nor access to that information but do believe that if given this knowledge change to their approach towards GIT could be made.

Social Influence

In this study, we tried to prove that social influence has an impact on decision-making when it comes to attitude toward GIT. In the past, it has been seen as a very impactful predictor when it comes to attitude (Molla et al., 2014; Ojo et al., 2019). In this study, however, social influence was not observed to have a large or significant effect on attitude. For almost all the indicators the median was a 4, a value that signifies that most of the respondents do not strongly feel one way or the other about the

influence their social circle exerts on their intentions towards GIT. This behavior can be attributed to the size of the sample collected, or the way that the questionnaire was built leading to a misinterpretation or miss answering of the provided questions. There is also the possibility that the respondents did not want to admit the influence that their social circle has on their behaviors and opinions leading to a mild answer, leading to almost no effect being detected by the PLS algorithm.

5.2. ENVIRONMENTAL CONCERN AND GIT PERCEIVED USE

As mentioned before Environmental concern has been widely used as an independent variable which in itself ends up as a large contributor to GIT attitude (Kranz & Picot, 2011; Subramanian et al., 2016; Zhang et al., 2019). In this study however it was found that Environmental concern can also have a large role in predicting GIT attitude through the moderating effect of GIT perceived use. This caused an indirect effect on GIT intention which was quite large ($\beta = 0.226^{**}$) on GIT attitude, and an even larger direct effect on GIT Perceived use ($\beta = 0.580^{**}$). This direct effect on GIT perceived use could be linked to environmental concern in the sense that if a consumer is more concerned about the environment, they have a greater inclination to understand and prefer GIT products over other products, which leads to a more positive attitude towards GIT products. The former link has been found in other studies (Kilbourne & Pickett, 2008), and as previously mentioned the more a consumer concerns themselves about the environment the more they will see the advantage of green products and so their attitude will improve towards them.

5.3. HABIT

This construct was built with indicators that reflected a consumer's change in routine, or habit, when choosing to adopt Green IT, how it affects their daily routine, purchase behaviors, and technology usage. Through the model that was developed in this study, we can observe that habit ends up having a large direct effect on GIT attitude ($\beta = 0.351^{**}$), meaning that most respondents feel that the more they nourish their habit of using Green IT the more positive attitude they have towards these products.

5.4. THEORETICAL IMPLICATIONS AND CONTRIBUTIONS

This study is a contribution to the already existing literature by linking consumers' values like knowledge, belief, and environmental concern, product qualities, and consumers' intentions towards Green IT products.

As it was suggested by other researchers the study of the adoption of Green IT concerning only IT professionals is limited (Kranz & Picot, 2011; Molla et al., 2014; Ojo et al., 2019), there was also a call for other factors outside the BAO framework to verify if there are any antecedent factors that could provide more insights into consumer intention. This study contributes to that by providing 3 more antecedents Habit, GIT perceived use, and Environmental concern.

The first variable, Habit has been used in the context of green product acceptance but so far has not been utilized in Green IT acceptance (Chuang et al., 2018; Ghazali et al., 2018; Subramanian et al., 2016). This study contributes to the literature by applying this variable not only to the study of Green IT but also in conjunction with other personal values such as GIT knowledge and belief, making this the first study to do so far.

Environmental concern has been studied in the context of Green IT before, but always as an independent variable (Kranz & Picot, 2011; Subramanian et al., 2016; Zhang et al., 2019). In this study, it was observed to have a moderating effect on Perceived GIT use, which has not been observed by any other study until today. This means that this study also contributes to the existing literature by proving that Perceived GIT use is heavily influenced by how much a person cares about the environment and preserving it.

This study also found that GIT belief, among consumers, has a greater effect on consumer intention than GIT knowledge, which until now was not the case, at least in the organizational context that it has been studied in (Molla et al., 2014; Ojo et al., 2019). This contributes to the existing literature not only because it offers a consumer-centric view of the BAO framework when applied to a consumer-centric study but also because consumers need to have belief in the product to act on their knowledge of it. Therefore, in this study, it is observed that only GIT knowledge is not a determining factor when it comes to consumer intention to adopt Green IT.

Finally, this study also contributes to the literature as Green IT has been studied by several researchers, but mostly in a business-centric environment with very little to no literature on Green IT consumer intention and behavior.

6. CONCLUSION

Nowadays IT and its products are a greater part of our day-to-day life to some even becoming a way of making a living and to some an essential part of their routine. Along with the increased usage and evolution of the IT field, environmental concern has also risen alongside it during the past 2 decades. This rise in Environmental concern is present in all age groups being a topic that generates a change in behavior and attitude. This behavior change can be made in many ways but one of the more frequent ones is the purchase of greener products or ones that are less damaging to the environment.

This study aimed to understand and discover which factors impacted consumers' attitudes towards Green IT and see which factors could be detrimental to changing a consumer's IT purchasing and usage patterns.

For this purpose, this study could be divided into 3 sections, the BAO framework, the UTAUT2, and the TPB. The BAO framework primarily focused on the consumer's belief and knowledge about Green IT and its impact on their intentions towards it. The UTAUT2 model was mostly used to study a person's motivation towards Green IT given the product's qualities, ease of use, and adaptation (Price expectancy, Habit, and Performance expectancy). Lastly, the TPB was used to test if a person's environmental concern would have an impact on their consumption habits.

This study differed from most studies around Green IT by analyzing the average consumer behavior rather than IT professionals which was the aim of most studies revolving around Green IT. This coupled with the fact that the respondents were all Portuguese makes this study the first in the area to study Green IT in a Portuguese consumer landscape.

The findings of this research lead to a very interesting conclusion that can contribute not only to the existing literature but also to future studies conducted in the field. The first discovery was the lack of statistical evidence that a consumer's knowledge of Green IT has an impact on their intentions to use it. On the other hand, we can see a greater effect of their belief on Green IT on their intentions. Their habit performance expectancy and environmental concern are very detrimental to predicting their intentions toward Green IT. Although all of these factors are valid there is still no statistical evidence that a user's social circle or the price of the products has any significant impact on their intentions to use Green IT.

This study helps paint a landscape of consumers and their intentions toward green technology products and their usage going forward. These users believe in the purchase and integration of these products in the market, which feels that their knowledge of them is very limited and that their integration into their day-to-day lives would not be an issue. These consumers do not feel that the price of the products would be an impactful factor or that their social circle would influence them whatsoever in the purchase and usage of these products.

From these conclusions, one statement can be made, that consumers understand the need for green products and that there are willing to adopt them, but knowledge about them should be made more readily available and widespread.

7. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE WORKS

The present study has some limitations and recommendations that are noteworthy. Most of the responses that were gathered had a lack of respondents from the ages of 26 to 41, future studies might want to try and gather more responses, especially in this age gap.

This study concerns almost exclusively Portuguese consumers, and this research should be extended to other countries and cultures to have different perceptions of Green IT consumer intentions. Some countries might be more altruistic, or some might be uninclined to make a change in this area.

During the analysis of the results, it was noted that the social influence construct had lackluster results not having almost any impact on the model that was proposed. This might be due to the construction of the questionnaire, which detailed which constructs the respondent was replying to. In future work, we recommend the questionnaire, not detail which constructs each question pertains to, this is because the respondents might be inclined to not want to answer truthfully if they feel that social influence does have an impact on their decisions.

For future studies, it is also recommended to analyze consumer behavior regarding other control factors, such as religious belief, place of residence, area of labor, and others. This might help bring out hidden factors in consumer behavior and extend the model proposed in this study.

Lastly, other constructs could be added to the model to test more hypotheses, for example from the UTAUT2 architecture only 3 of the constructs were used, other ones such as Experience hedonic motivation or facilitating conditions might be interesting to add to the model to see if consumer intention can be even better explained.

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APPENDIX (OPTIONAL)

8.1. ADMINISTERED QUESTIONNAIRE

Caro participante:

O presente questionário destina-se a um estudo integrado no Mestrado de Data Science e Advanced Analytics, com especialização em Data science. Tem como objectivo avaliar os factores que influenciam a adoção de produtos de tecnologia verdes e práticas ecologicamente correctas na utilização dos mesmos, sendo isto denominado de Green IT.

Este questionário tem uma duração aproximada de 5 a 10 minutos de modo a avaliar a sua percepção, hábitos e intenção de compra destes produtos.

A participação neste questionário é completamente opcional e anónima, logo não existe qualquer tipo de risco envolvido. As respostas serão utilizadas para fins académicos dentro do foco deste estudo.

Obrigado pela sua participação!

Qualquer duvida por favor não exite em contactar:
R20170760@novaims.unl.pt

Algumas das suas características incluem, a maximização da eficiência energética dos produtos, a utilização de materiais reciclados e os produtos serem biodegradáveis após o seu fim de vida.

Um exemplo destes produtos são os modelos mais recentes de Iphone. Estes possuem um chassis de alumínio, um material completamente reciclável e não possuem químicos como PVC e BFR's.

A utilização ecologicamente correcta de produtos de IT, também está encapsulada no conceito de Green IT, práticas como desligar os produtos quando não os estamos a utilizar e a utilização de modos como poupança de energia.



Conhecimento de Green IT

	1 - Discordo Totalmente	2	3	4	5	6	7- Concordo totalmente
Possuo conhecimentos de Green IT (ex. dispositivos eficientes em termos energéticos, computação na cloud)	☐	☐	☐	☐	☐	☐	☐
Concordo que utilizar Green IT é uma alternativa pessoal	☐	☐	☐	☐	☐	☐	☐
Concordo que energia verde pode substituir energia fóssil e nuclear	☐	☐	☐	☐	☐	☐	☐
Concordo que Green IT pode afetar a minha conta da eletricidade	☐	☐	☐	☐	☐	☐	☐
Concordo que Green IT é de confiança e seguro	☐	☐	☐	☐	☐	☐	☐
Recebo informação suficiente acerca de programas que promovem o Green IT	☐	☐	☐	☐	☐	☐	☐

Influência social

	1- Discordo Totalmente	2	3	4	5	6	7- Concordo Totalmente
As pessoas que influenciam o meu comportamento pensam que devia praticar Green IT	☐	☐	☐	☐	☐	☐	☐
Acredito que muitas pessoas que me são importantes usam tecnologias verdes	☐	☐	☐	☐	☐	☐	☐
Acredito que muitas pessoas que eu valorizo a opinião utilizam tecnologias verdes	☐	☐	☐	☐	☐	☐	☐
Acredito que muitas pessoas que me são importantes usam tecnologias verdes para salvar o ambiente	☐	☐	☐	☐	☐	☐	☐
Pessoas que são importantes para mim pensam que eu devia praticar o Green IT	☐	☐	☐	☐	☐	☐	☐

Crença em Green IT

	1- Discordo totalmente	2	3	4	5	6	7- Concordo Totalmente
Eu acredito que equipamento de IT e sistemas contribuem para a emissão de gases que provocam efeito estufa	☐	☐	☐	☐	☐	☐	☐
Eu acredito que consumidores de IT deveriam ser responsáveis por reduzir gases que provocam o efeito estufa	☐	☐	☐	☐	☐	☐	☐
Eu acredito que IT podem ser utilizadas para reduzir a pegada de carbono de um consumidor	☐	☐	☐	☐	☐	☐	☐
Acredito que consumidores de IT podem desempenhar um papel importante	☐	☐	☐	☐	☐	☐	☐

Atitude acerca de Green IT

	1- Discordo totalmente	2	3	4	5	6	7- Concordo Totalmente
Considero que Green computing é conveniente para praticar em casa (ex. comprar produtos de empresas verdes, participar em programas de reciclagem de IT)	☐	☐	☐	☐	☐	☐	☐
Considero que Green computing é algo que devo praticar em casa	☐	☐	☐	☐	☐	☐	☐
Considero que Green computing é agradável de exercer em casa	☐	☐	☐	☐	☐	☐	☐
Estou muito preocupado em reduzir o consumo de eletrecidade de tecnologias	☐	☐	☐	☐	☐	☐	☐
Consumidores de IT deveriam estar muito preocupados com o seu consumo de eletrecidade	☐	☐	☐	☐	☐	☐	☐
Considero que Green computing é o sensato a praticar em casa	☐	☐	☐	☐	☐	☐	☐

Práticas Pro-Green IT

	Sim	Não
Utilizo as opções de gestão de energia nos dispositivos de IT que utilizo regularmente	☐	☐
Desligo os meus computadores quando não os estou a utilizar	☐	☐
Compro equipamento de IT reciclado para uso pessoal	☐	☐

Expectativa de Desempenho

	1- Discordo totalmente	2	3	4	5	6	7- Concordo Totalmente
Acredito que consigo poupar recursos e reduzir as emissões de gases efeito estufa a utilizar Green IT	☐	☐	☐	☐	☐	☐	☐
Acredito que produtos Green IT são tão produtivos como outros produtos de IT	☐	☐	☐	☐	☐	☐	☐
Acredito que produtos Green IT conseguem ajudar-me a reduzir o meu consumo de energia	☐	☐	☐	☐	☐	☐	☐
Tenho tempo para procurar alternativas verdes de tecnologia	☐	☐	☐	☐	☐	☐	☐
As características inerentes de Green IT optimizam os dispositivos	☐	☐	☐	☐	☐	☐	☐
Tecnologias verdes são mais rápidas que outras tecnologias	☐	☐	☐	☐	☐	☐	☐
Acredito que produtos Green IT são úteis na minha vida diária	☐	☐	☐	☐	☐	☐	☐

Hábito

	1- Discordo totalmente	2	3	4	5	6	7- Concordo Totalmente
A utilização de produtos Green IT é um hábito meu	☐	☐	☐	☐	☐	☐	☐
Sou a favor da utilização de produtos Green IT	☐	☐	☐	☐	☐	☐	☐
Sinto necessidade de utilizar produtos Green IT	☐	☐	☐	☐	☐	☐	☐
Eu sou dependente de Green IT no meu dia a dia	☐	☐	☐	☐	☐	☐	☐
Eu deveria utilizar sempre Green IT	☐	☐	☐	☐	☐	☐	☐
É-me natural a utilização de tecnologias verdes	☐	☐	☐	☐	☐	☐	☐
A compra de produtos de Green IT é natural para mim	☐	☐	☐	☐	☐	☐	☐

Preocupação pelo meio ambiente

	1- Discordo totalmente	2	3	4	5	6	7- Concordo Totalmente
O equilíbrio da natureza é muito delicado e facilmente influenciável	☐	☐	☐	☐	☐	☐	☐
A humanidade está severamente a abusar do ambiente	☐	☐	☐	☐	☐	☐	☐
O tema da poluição é algo que me provoca preocupação	☐	☐	☐	☐	☐	☐	☐
É mais conveniente comprar novos produtos de IT do que repará-los	☐	☐	☐	☐	☐	☐	☐
Os recursos que eu consumo são muito mínimos e não causam qualquer tipo de poluição	☐	☐	☐	☐	☐	☐	☐
Não existe a necessidade de envolver outros em comportamentos verdes	☐	☐	☐	☐	☐	☐	☐
É-me muito atrativo centrar-me na poupança de energia no que diz respeito aos produtos de IT	☐	☐	☐	☐	☐	☐	☐
É importante demonstrar motivação para comportamentos verdes	☐	☐	☐	☐	☐	☐	☐

Género

Masculino

Feminino

N/A

Idade

País

Portugal

Outro (Por favor indicar qual)

Grau de escolaridade

Ensino Básico

Ensino Secundário ou equivalente

Licenciatura

Mestrado ou Pós-Graduação

Doutoramento

Situação Profissional

Estudante

Trabalhador por conta de Outrem

Trabalhador por conta própria

Desempregado

Reformado



NOVA Information Management School
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