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Research Article

Sustainable Computing: A Determinant of Industry 4.0 for Sustainable Information Society

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Rapid advancement in technology and continuous environmental degradation have attracted the attention of practitioners toward sustainable solutions. This study intends to promote Industry 4.0 information society research by comprehending sustainable ICT adoption in businesses to promote sustainable information society (SIS). Further, it extends the theory of planned behavior model and deploys a quantitative research approach. The findings from PLS-SEM confirm the perceived environmental responsibility (PER), a precursor for attitude (ATT), perceived behavioural control (PBC), and subjective norm (SN). Further, there is a significant positive influence of ATT, PBC, and SN on the adoption intention of sustainable ICT practices followed by the effect of adoption intention on sustainable information society (SIS). This study bridges the literature gap through a novel attitude behavior gap model and provides a possible understanding of how businesses might contribute to the creation of sustainable development and information society.

1. Introduction

Industry 4.0 (I4.0), a contemporary manufacturing system propelled by information technology (IT) and aimed at producing a sustainable society, has emerged in the modern world and is being used. The driving factors for ecological sustainability include rising pollution, climate change, and concerns about energy usage. With the advent of technology and rapid economic development, people are getting worried about its impact on the environment [1]. Sustainable development supports circular economic goals within the context of Industry 4.0. Furthermore, Industry 4.0 contributes to Sustainable Development Goals (SDG) by bridging the gap between industry and sustainability through the mutual component connects. Technological advancement is facilitating the difficult shift from outmoded to intelligent machinery without compromising the industrial sector's sustainability, as envisaged by the 2030 Sustainable Development Goals of the United Nations. Undoubtedly, in the recent past, there has been a huge investment in technological advancement front by institutions and simultaneously, it has increased its impact on the environment. A high volume of computing devices has increased energy consumption and become a liability for institutions. Sustainability in information and communication technologies (ICT) is the most debated word to overcome environmental deterioration.

Sustainable information and communication technologies (ICT) have been observed as a technique to channel the energy of a system and enhance operational efficiency [2]. Green ICT mainly focuses on the usage, design, and disposing of computing devices in such a way that it creates a minimum hindrance to the environment [3].

The speed with which civilization has progressed has been aided by the continued expansion of information and communication technologies (ICT). The information society is essential for growth, social progress, well-being, and also long-term development. High-development countries in terms of information society also have high levels of social and economic progress [4]. In today's culture, information and communication technology (ICT) may be used to promote sustainable practices and processes and to promote administrative approaches and techniques that will enable enterprises, government organizations, and people to contribute to long-term progress. The information society has immense potential for economic progress and social well-being, but it can also be a source of challenges and hazards. It will have the opportunity to enhance new social stratification and divisions, as well as economic diversity, privacy loss, and data and computer crimes. As a result of the aforementioned factors, scholars have looked into the intersections between the information society, ICT adoption, and long-term development. This investigation gave rise to the concept of the sustainable information society (SIS). The term "sustainable information society" leads to a fundamental step in the process of the information age in which green ICT is a key enabler of long-term sustainability [5].

A significant driver of the digitalization era has been identified as Industry 4.0. From the views of the circular economy, the triple bottom line, and sustainable business models, its implications for sustainable development have drawn a lot of attention. The level of awareness and adoption of green information technologies is in the nascent stage as rightly pointed out that there exist four gaps namely; "knowledge gaps, practice gaps, opportunity gaps, and knowledge-doing gaps" [6]. Sustainable ICT practices rely on enhancing the effectiveness and efficiency of computing devices. Most of the research studies on the topic of sustainable ICT-SIS are based on developed countries and very limited research studies are on developing nations. The global market is facing a concern regarding the disposal of electronic waste. As per United Nations 2019 report entitled "A New Circular Vision for Electronics, Time for a Global Reboot", out of the total consumer electronic waste trash of 44 million tons, only 20% is being recycled sustainably. India is one of the fastest-growing economies with an attractive business opportunity for the world market. India created 1,014,961 tons of e-waste in FY 2019-2020, increasing 32% from FY 2018-2019, according to a 2020 study by the Central Pollution Control Board, India. According to the research, only 3.6 percent and 10% of these were collected in the country in 2018 and 2019, respectively. Human behavior in support of such practices must be monitored to assess the success of sustainable ICT practices. The paucity of research studies focusing on individual adoption intention and actual adoption behavior provides a strong foundation for this research.

The theory of planned behavior (TPB) has been widely used in studies with sustainable adoption intention. The attitude-behavior gap was studied in developing countries to understand green consumption behavior [7]. TPB was extended with sustainable government support, environmental concern, and green engagement to study green building practices, and further benefits were also highlighted for integrating IoT with green building [8, 9]. To bridge the literature gap, this study attempts to investigate educated individual beliefs and behaviours towards sustainable ICT in enterprise strengthens the sustainable information society (SIS).

This chapter is organized into seven sections. Section 1 covers the introduction and objectives. The second section reviews the theoretical background of the study. Part 3 develops a conceptual framework, which is then followed by section 4. In the fourth section, the questionnaire survey and study method are detailed. The study's data analysis and empirical findings are provided in section 5. A detailed discussion of the study finding and its implication are included in the sixth part of the chapter and the study limitation and future research directions are highlighted under section 7.

2. Theoretical Underpinnings

A variety of ICTs are added to the Industry 4.0 idea in order to connect facilities and assets, give meaning to data, and digitise business processes. Reduced materials and energy flows connected with ICT services and goods make them more sustainable over their full life cycle. The term "sustainability by ICT" refers to the use of ICT to create, enable, and promote sustainable consumption of resources [5]. Practitioners have started focusing on sustainable ICT solutions and identified ecological efficiency and ecological effectiveness as the drivers for the adoption of sustainable ICT practices. Ecological efficiency relies on operational cost reduction, and ecological effectiveness focuses on the establishment of a sustainable value and belief system [10]. ICT that is environmentally, socially, culturally, and economically sustainable can improve continuous development. Sustainable ICT may help the environment by lowering consumption of resources in the social sector by giving immediate access to opportunities, in the cultural sector by increasing cultural understanding, and in the economy by driving growth. Information systems can help achieve long-term sustainability by promoting economic activities that balance nature with human and social well-being [11, 12]. The term "sustainable information society" (SIS) leads to a fundamental step in the process of the information society in which sustainable ICT is a key enabler of long-term sustainability with reference to Industry 4.0 [5, 13]. It explained five different heads to explain social sustainability, i.e., ecological sustainability, economic sustainability, sociocultural sustainability, technological sustainability, and political sustainability. Ecological sustainability maintains responsible natural resource utilization within the best ability of the enterprise. Economic sustainability focuses on maintaining a competitive edge by adopting sustainable business models. Socio-cultural sustainability is considered
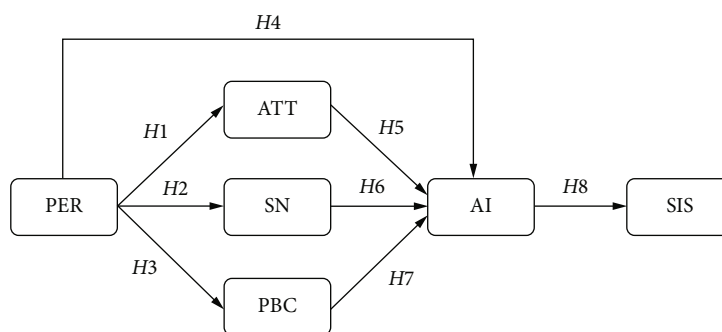
FIGURE 1: Conceptual framework.

as being focused on social networks, contributing to the community, establishing a feeling of place, and providing communal protection and peace. Technological sustainability relies on sustainable technological practices. The core values of democracy and successful ownership of all liberties are required for political viability. It has to do with businesses' participation in establishing a democratic society.

Adoption of sustainable ICT not only reduces operational costs but also helps to build a better corporate image, employee motivation, and employee retention [14, 15]. It is also evident to state that the effectiveness of the sustainable ICT solution depends on individual value, belief, and intention toward its actual adoption [16]. Hence, it becomes indispensable for organizations to comprehend individual intention towards sustainable ICT to attain ecologically sustainable strategic disclosure [17]. Furthermore, Industry 4.0 technologies can improve operational efficiency by reducing machine operation time and waste.

3. Model and Hypothesis

Fishbein and Ajzen [18] and Ajzen [19] proposed the theory of reasoned action (TRA) which was found to be a fundamental framework to understand human behavior based on their intention to accept or reject a given action. However, the intention was defined by two decision variables: attitude and subjective norm. Attitude is defined as a list of beliefs that may transform intention to carry out the act. Subjective norm is in line with the normative belief that the social circle determines individual intention to perform the act. An individual's willingness to execute an act is referred to as behavioural intention [19]. TPB (theory of planned behavior) is an addition to TRA and included the third construct perceived behavior control, which states an individual's comfort or discomfort while performing the act. TPB further explains that the strength of individual intention to perform an act determines actual behavior to perform the act. The strength of intention to perform an act is directly proportional to the attitude towards the behavior, subjective norm, and perceived behavioural control. The TPB model has also been widely investigated in terms of behavioural intention and proenvironmental behavior and has been demonstrated to be an excellent model [20, 21].

Model adapted from literature is an extension of TPB. The conceptual framework represented in Figure 1 mainly includes six constructs: perceived environmental responsibility (PER), attitude (ATT), subjective norms (SN), perceived behavioural control (PBC), adoption intention (AI), and sustainable information society (SIS). The emotional involvement of an individual in environmental problems explains perceived environmental responsibility [22]. Individuals with a high level of environmental responsibility are likely to have a positive attitude towards the green environmental act [23]. Furthermore, literature provides sufficient empirical evidence for the influence of perceived environment on attitude, subjective norm, and perceived behavioural control [24].

H1: PER is positively related to individual ATT towards sustainable ICT.

H2: PER is positively related with individual SN towards sustainable ICT.

H3: PER is positively related to individual PBC towards sustainable ICT.

H4: PER is positively related to individual AI towards sustainable ICT.

Attitude is described as a positive or negative opinion towards conducting a particular behavior and is found to be a significant predictor to get engaged in an environment-friendly act [25]. Regarding sustainable ICT, individuals with a higher level of awareness and favourable attitude are more intended towards the adoption of such technologies [26]. Subjective norm signifies the influence of family, friends, and colleagues on individual intention to perform specific behavior. An individual with more social pressure is more likely to get liked to green ICT practices. An individual does buy sustainable products if he has the wish, time, and convenience of purchasing it. A self-motivated consumer will buy green products if has enough resources for buying them [27]. Perceived behavioural control is considerably and positively linked with purchase intention and this has been proved in past studies [28]. The behavioural intention has a significant direct influence on actual adoption behavioural [29]. Sustainable ICT adoption can help to attain a sustainable information system (SIS) by reducing resource consumption and by ensuring better access to information. It promotes cultural sustainability through increasing cultural awareness and contributes to the

long-term viability of the economy by stimulating growth. Furthermore, political stability can be achieved through utilizing ICT to improve business relationships as well as governments' policy implications [30] Sustainable ICT influences different types of sustainability dimensions to attain sustainable information society (SIS).

H5: ATT is positively related to AI towards sustainable ICT.

H6: SN is positively related to AI towards sustainable ICT.

H7: PBC is positively related to AI towards sustainable ICT.

H8: AI towards sustainable ICT has a significant positive influence on the development of SIS.

Based on the above discussion, Figure 1 shows the relationship between the constructs and the proposed hypotheses in the study.

4. Methodology

To understand better participants' intentions towards adoption intention (AI) of sustainable ICT practice for sustainable information society (SIS), quantitative research mixed with a cross-sectional survey approach has been used in the study.

4.1. Instrument. The scale validated from the literature has been adopted in the study. Attitude (ATT), subjective norm (SN), and perceived behavioural control (PBC) have been considered from the existing TPB model. The latent construct perceived environmental responsibility (PER), adoption intention (AI) towards sustainable ICT practice, and sustainable information society (SIS) have been used in addition to the existing TPB model. Adoption intention (AI) towards sustainable ICT practice was measured through the indicators developed based on sustainable ICT-knowledge awareness, evaluation, and implementation. Sustainable information society (SIS) was framed on the social sustainability dimensions ecological, economic, socio-cultural, and political sustainability. The attitude was measured on a semantic differential scale (extremely bad is equal to 1 and extremely good is equal to 7), and other items were measured on seven-point Likert scale (1 means strongly agree to 7 which means strongly disagree). Descriptions of latent constructs are detailed in Table 1.

4.2. Sample and Data Collection. A questionnaire was designed as a survey instrument to target respondents within the age group of 18-44 years. The educated person can simplify and better comprehend proenvironment behavior [34]. The questionnaire consisted of 24 statements was administered in Delhi, India. To familiarize respondents with the research context the research instrument starts with the general description on sustainable ICT "using ICT in ways that help to reduce the environmental impact, which includes using energy more efficiently and reducing waste" [35]. Participants had promised that their answers would be used for scholarly purposes. The sample for the study includes working professionals of vivid industries located in Delhi. The

selection of area of study was based on its ongoing and innovative transformation role in the development of research and science, support for advancement, use of technical expertise, and technology transfer. According to the report of IBEF, 2021 [36], Delhi is among the country's most rapidly rising states. The advance projection for Delhi's Gross State Domestic Product (GSDP) in 2020-21, at current prices, is Rs. 7.98 trillion (US$ 108.33 billion). Between 2015-16 and 2020-21, the state's GSDP (in Rs.) grew at a CAGR of 7.70%.

The data were collected within four months from July-October, 2021. A nonprobabilistic convenience sampling technique was deployed in study. A total of 400 questionnaires were distributed, with 205 remaining for analysis after being completed in all respects and generating a response rate of 51%. If the answer rate is less than 85%, a nonresponse error test is recommended to confirm the study's external validity [20]. We divided the samples into three categories to determine nonresponse error: (i) early responders (nonreminder responses); (ii) late respondents (reminder responses); and (iii) nonresponders (no submission of the questionnaire) [5]. Result from the χ^2 test report that there is no difference among the three groups based on social factors, demographic features, and variables in the study, ruling out nonresponse error.

Table 2 shows that out of the total respondents, 84 (40.98%) were female and 121(59.02%) were male. The majority of the respondents were graduates (54.64%) within the age group of 30-40 years. Key industries considered in the survey are based on the report of IBEF, 2021. 38.04% of the total respondents were from IT and logistics followed by BFSI (28.79%), construction and real estate (22.43%), and agri and processed food (10.74%). Data descriptive also confirms that 49.28% of the respondents included in the study have an intermediate level of familiarity with ICT tools are involved in one or other form with its practices.

5. Analysis and Findings

Data analysis was performed using SPSS 21.0 and SmartPLS 2.0. Descriptive and demographic of respondents were ascertained through SPSS 21.0. Based on the study's predictive character, Structure Equation Modelling was used to construct a connection between a collection of latent variables using SmartPLS 2.0. Because it has no sample limits and suits the research's predictive nature, PLS-SEM is more frequently accepted. Anderson and Gerbing (1988) employed a two-step modelling technique. The outer model evaluation was conducted first, to verify the study's reliability and validity, followed by the structural model validation.

5.1. Measurement Model Assessment. The construct's relationship with its indicators is evaluated using the measurement model. Gefen and Straub's approach was used to test the measurement model's convergent and discriminant validity (2005). Convergent validity was explained using indicator loading, composite reliability (CR), and average variance extraction (AVE). Table 3 shows that the construct's composite reliability (CR) ranges from 0.809 to

TABLE 1: Description of latent construct.

Sr. no.	Construct	Scale	Reference
1		PER1: express your level of willingness to save the environment.	
2	PER: perceived environmental responsibility	PER2: environment protection is the responsibility of the government, not the individual.	[31]
3		PER3: I have taken environmental responsibility since my early days.	
4		PER4: I should be accountable for saving the environment.	
5		ATT1: performing sustainable ICT practices are extremely bad (1)/extremely good (7)	
6	ATT: attitude	ATT2: performing sustainable ICT practices are extremely undesirable (1)/ extremely desirable (7)	[25]
7		ATT3: performing sustainable ICT practices are extremely unenjoyable (1)/ extremely enjoyable (7)	
8		ATT4: performing sustainable ICT practices are extremely unfavorable (1)/ extremely favourable (7)	
9		SN1: people close to me think that I should use sustainable ICT practices	
10	SN: subjective norm	SN2: people opinion I value most suggest that I should use sustainable ICT practices	[27, 32]
11		SN3: favourable nature of my friend and colleagues influences me to use sustainable ICT practices	
12		SN4: many people like me use sustainable ICT practices	
13		PBC1: I am willing to use sustainable ICT practices	
14	PBC: perceived behavioural control	PBC2: if it is up to me, then I would use sustainable ICT practices	[24]
15		PBC3: it seems that using sustainable ICT practices are not in my control	
16		PBC4: I would use sustainable ICT practices	
17		AI1: I am knowing the benefits of sustainable ICT in business.	
18	AI: adoption intention	AI2: I will put required efforts to use sustainable ICT practices	[33]
19		AI3: technical and economic analysis is done beforehand to use sustainable ICT practices	
20		AI4: sustainable ICT practices are required for fulfilling the strategic requirement	
21		SIS1: sustainable ICT practices reduce the production cost and enhance sales	
22	SIS: sustainable information society	SIS2: sustainable ICT practices promote an efficient management system.	[5]
23		SIS3: sustainable ICT practices provide a secure work environment and reduce social exclusion.	
24		SIS4: sustainable ICT practices promote effective e-public services.	

0.904, which is much higher than the specified requirement of 0.7, implying that the scale items drawn from the literature have internal consistency [37]. Most dependable indicators have a factor loading greater than 0.7. [38]. For evaluation, all indicators with a factor loading greater than 0.7 were kept. Furthermore, once all underlying conceptions describe over 50% of the variance in the indicators, convergent validity is ensured. The average variance extracted (AVE) for all of the latent constructs was found to be greater than 0.5, ranging from 0.578 to 0.704. [39].

Discriminant validity was investigated to examine how significant aspects were in determining the construct. Table 4 shows the correlation matrix with the square root of AVE (AVE) diagonally and off-diagonal latent variable correlation (LVC). Discriminant validity is established when

the square root of AVE is greater than the latent variable correlation (LVC) [39]. As a result, the model's dependability and validity were determined to be sufficient for further structural model evaluation.

5.2. Structural Model Assessment. The inner model analyses construct to build acceptable relationships. [40] proposed three criteria for evaluating the inner model: path coefficient (β), R^2 (coefficient of determination), and Q^2 (predictive relevance).

Proposed hypothesized relationships were tested and a result for the same is represented in Figure 2. Nonparametric bootstrapping was employed to examine the proposed relationship among constructs. The finding of the study does not provide much empirical support for the effect of

TABLE 2: Demographic profile.

Characteristics	Frequency	%
Gender		
Male	121	59.02%
Female	84	40.98%
Age (years)		
18-26	40	19.51%
27-35	89	43.42%
36-44	76	30.07%
Industries		
IT and logistics	78	38.04%
Banking, financial services, and insurance (BFSI)	59	28.79%
Construction and real estate	46	22.43%
Agri and processed food	22	10.74%
Qualification		
Graduate	112	54.64%
Postgraduate and above	93	45.36%
ICT reach		
Advanced	31	15.12%
Intermediate	101	49.28%
Beginner	73	35.60%
Total	205	100

individual perceived environmental responsibility on the adoption intention of green IT practices (H4: $\beta = -0.020$, $t = 0.979$). The causal effect of other constructs was supported. PER has strong positive significant influence on ATT (H1: $\beta = 0.571$, $t = 18.736$) followed with PBC (H3: $\beta = 0.463$, $t = 12.903$) and SN (H2: $\beta = 0.346$, $t = 8.469$). The decision variable ATT (H5: $\beta = 0.438$, $t = 11.825$) was found to be the dominating factor towards AI of green IT practices followed by PBC (H7: $\beta = 0.226$, $t = 7.602$) and SN (H6: $\beta = 0.162$, $t = 5.589$). The result of the study also confirms a significant positive direct influence of AI (H8: $\beta = 0.511$, $t = 19.984$) towards SIS of green IT practices. The predictive ability of the model was measured through the R^2 value against the suggested range of 0.19, 0.33, and 0.67 indicating weak, moderate, and substantial effect, respectively [40]. The extended TPB model exerts a significant moderating influence on adoption intention and sustainable information society. Using bootstrapping and cross-validated redundancy, the Stone-Geisser Q^2 (Geisser, 1975; Stone, 1977) was determined. The Q^2 calculated at an omission distance of 7 was found to be greater than the standard threshold of 0 [38]. The suggested model's improved predictive performance justifies the decision to add more constructs to the existing model. The variance inflation factor (VIF) has a value of 1.621-2.843, which is significantly less than the specified limit of 5 and thereby eliminates multicollinearity in structural models.

6. Discussion and Implication

Industry 4.0 covers a wide range of cutting-edge technology and presents numerous theoretical ideas associated with the current fourth industrial revolution. Numerous studies addressed different aspects of the information society's long-term viability. Even though much work has been put into the information age, environmental sustainability, and ICT adoption, there are few findings on the impact of sustainable ICT adoption on the information society's sustainability. In developing countries' contexts, this study is making a novel contribution to look into the relationship between sustainable ICT adoption in businesses and the information society's long-term viability, both conceptually and empirically. Literature mainly addresses the issue of sustainable ICT adoption from an organizational perspective but limited research focuses on its adoption from an individual behavioural perspective [41].

Study outcome indicates that attitude, perceived behavioural control, and subjective norm are the significant predictors of sustainable ICT adoption intension followed with the sustainable information society. The additional construct added to the model perceived environmental responsibility also significantly predicts attitude, subjective norm, and perceived behavioural control of professionals towards sustainable ICT practices. Environmental responsibility has shown a relation to environmental education in different countries and cultural scenarios. The strongest significant influence of perceived environmental responsibility on attitude explains that people are well aware of their responsibility towards the environment helps in developing a favourable attitude towards adoption intention of sustainable ICT solutions. The responsibility towards the environment also influences perceived behavioural control and subjective norms. Further, it is also noteworthy that being responsible towards the environment is not sufficient

TABLE 3: Result measurement model.

Construct	Scale	Loading	AVE	CR
PER: perceived environmental responsibility	PER1	0.719	0.578	0.845
	PER2	0.824		
	PER3	0.751		
	PER4	0.743		
ATT: attitude	ATT1	0.719	0.704	0.904
	ATT2	0.870		
	ATT3	0.889		
	ATT4	0.866		
SN: subjective norm	SN1	0.759	0.586	0.809
	SN2	0.704		
	SN3	0.829		
	SN4	**0.436**		
PBC: perceived behavioural control	PBC1	0.818	0.627	0.835
	PBC2	0.787		
	PBC3	0.771		
	PBC4	**0.328**		
AI: adoption intention	AI1	0.807	0.668	0.857
	AI2	**0.346**		
	AI3	0.877		
	AI4	0.764		
SIS: sustainable information society	SIS1	0.789	0.665	0.888
	SIS2	0.789		
	SIS3	0.846		
	SIS4	0.834		

Factor loading<0.7 are highlighted in bold.

TABLE 4: Discriminant validity.

	Latent variable correlation (LVC)						Criterion
	SIS	AI	PBC	SN	ATT	PER	$\sqrt{AVE} >$ LVC
SIS	**0.815**						✔
AI	0.511	**0.817**					✔
PBC	0.499	0.510	**0.791**				✔
SN	0.374	0.479	0.482	**0.765**			✔
ATT	0.532	0.617	0.493	0.492	**0.839**		✔
PER	0.473	0.386	0.467	0.342	0.578	**0.760**	✔

enough for developing favourable adoption intention for sustainable ICT applications as the relationship between perceived environmental responsibility and adoption intention was found to be insignificant.

The individual attitude was discovered to be the most powerful predictor for sustainable ICT adoption. Sustainable ICT attitude refers to "sentiments, values, and norms with climate change, ecosustainability, and ICT's role" and level of awareness for the effect of information technology on surroundings [10, 20]. Attitude or belief mainly represents that individuals are concerned about the environment which directs to proenvironmental behavior. Marketers should take this opportunity for extensive product promotion and deploy marketing strategies to build a strong product image for endpoint users. The considerable positive relationship of perceived behavioural control on sustainable ICT adoption intention suggests that adolescents with the resources, time, and inclination to adopt green computing are reliant on the availability of sustainable solutions to acquire it. Marketers could utilize enhanced visibility, end-user benefits, and cheap options to bridge the gap between customers and sustainable solutions. Subjective norms were reported as a week antecedent to adoption intention as compared to attitude and perceived behavioural control. The significant positive influence of subjective norm indicates that youth give due importance to the opinion of friends and colleagues. Sustainable ICT adoption also has a significant positive influence on actual adoption behavior. The findings of the study are in line with the outcomes of [24, 42, 43]. Businesses involved in sustainable IT solutions should start a green campaign and educate individuals that how the adoption of sustainable ICT solutions can curb pollution. Companies should also focus on the fact of how the actual adoption of sustainable ICT practices can ease their day-to-day life activities. It is also evident from the findings that participants are inclined toward a green environment and believe in a clean healthy life.
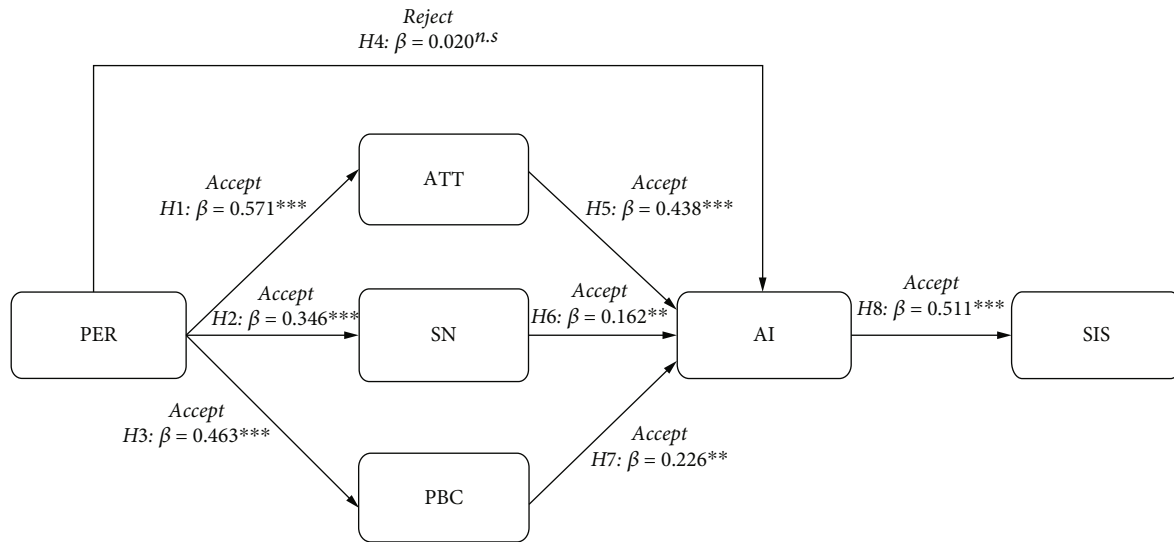
Figure 2: Result structural model.

The estimated model is valid. It enables firms to comprehend how sustainable ICT adoption contributes to the information society's long-term viability. It answers the question of whether increasing sustainable ICT awareness, evaluation, and implementation in businesses leads to an increase in the information society's long-term viability. The aforesaid findings successfully demonstrated that sustainable ICT awareness, evaluation, and implementation provide a major and beneficial contribution to ecological, economic, socio-cultural, and political sustainability. The suggested extended framework provides scholars and marketers with significant insights that may be used to develop long-term plans and policies for future market research opportunities. Based on the findings, it is acceptable to conclude that the findings of the study contribute to the existing research on the sustainable information society. [5, 30, 44, 45].

Scholars may also use the findings of this study to expand their research on the SIS. The proposed theoretical model can further be used by researchers across cross-cultural samples following a similar approach. The model and technique together make up a pretty comprehensive package for determining correlations between sustainable ICT adoption and other related factors. However, researchers may develop, verify, and test new ideas to strengthen the concept of a sustainable information society.

This research has several managerial ramifications as well. The findings provide a framework that includes a variety of benefits such as ecological, economic, socio-cultural, and political benefits that can be acquired as a result of sustainable ICT adoption. The findings show that businesses should focus their efforts on uplifting sustainable ICT awareness, evaluation, and implementation practices. Moreover, the findings may be used to assist businesses in developing sound sustainable ICT adoption infrastructure to attain the 2030 Agenda for Sustainable Development. Overall, the findings of the study provide a possible understanding of how businesses might contribute to the creation of sustainable development and information society.

7. Limitations and Future Research Direction

The current three layers of research limitations generate scope for future research. First, the conceptions of sustainable ICT adoption and sustainability in the information society are relatively new that need to be further studied and empirically validated. Replicative studies with a larger demographic base might help to reverify the research findings. Second, the study follows a cross-sectional survey design to examine sustainable ICT adoption. Adoption is a forerunner to a sustainable information society, indicating that there exists an attitude-behavior gap. Future research should concentrate on longitudinal research design to highlight important factors of sustainable adoption behavior and sustainable information society over some time. Third, the study participants were limited to businesses; it is just the perspective of businesses on ICT adoption as a means of ensuring long-term sustainability in the information society. When applying the findings to the sustainable information society, caution is advised. Furthermore, the research might be expanded in the future by looking at the relationship between personality traits, social, economic, and cultural aspects and the adoption of sustainable technologies.

Data Availability

All data are available in manuscript.

Conflicts of Interest

There is no conflict of interest between the authors in this article.

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