

The impact of smart sustainability on tourist destination appeal

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Abstract

The emergence of the smart cities and the smart tourism destinations in recent years has given rise to fresh expectations for the sustainability of tourism destinations. It is shown that Information and communication technology developments have fundamentally changed the tourism industry by physically intercommunicating things. Smart sustainability is used to express the concept of using smart technologies to achieve efficient management of tourism activities in tourism destinations which maximizes resource use and achieves environmental benefits. The study aimed to evaluate the impact of smart sustainability on destination appeal. Data were collected from 400 tourists through a questionnaire that was distributed in various tourism cities in Egypt. The results showed that there is a positive relationship between smart sustainability in its three dimensions (the environmental dimension, the social dimension, and the economic dimension) and the Egyptian tourism destination's appeal.

Keywords: information and communication technology, smart city, smart tourism destination, sustainability, destination appeal.

1. Introduction

Technology improvements have had a huge impact on the expansion of the tourism industry. The popularity of IT and communication technology led to the creation of the smart idea, which has recently received a lot of traction (Boes et al., 2016). These Smart Tourism technical innovations typically have a positive impact on the tourism business, tourism-related activities, and customer satisfaction (Caragliu et al., 2011). Over the past few years, smart tourism has progressed into a vision and a general strategy that enables many destinations to create initiatives for creating new technological infrastructures, creating smart end-user applications, and recognizing innovation that guarantees a variety of benefits, ranging from effectiveness to sustainability. Sustainability is one of the ultimate goals of every smart business. Tourism and, subsequently, the quality of many destinations' natural resources are becoming increasingly important to their profitability, especially when those resources are scarce or in short supply. In order to maintain the preservation of natural resources, sustainable use of those resources is necessary (Gretzel et al., 2015). The sustainability of the management of scarce and non-renewable resources may be improved in smart destinations that heavily incorporate innovation and technology into their operations (Sorokina, 2019). Accordingly, this study aimed to assess the impact of smart sustainability on destination appeal.

2. Literature Review

2.1 Smart and sustainable destinations: smart sustainability

The concept of a smart city, where intelligence is integrated into people's daily lives, governance, the economy, and the environment, provides the foundation for the concept of a smart tourism destination which aims to support sustainability and enhance the quality of life for their citizens (Gajdosik, 2019). A smart city is a place where technology is used to maximize sustainability and improve residents' quality of life (Sigalat-signes et al., 2019). Tourism destinations have adopted smart technology such as artificial intelligence, cloud computing, the Internet of Things, and mobile communication to improve visitor experiences (Jeong & Shin, 2020). A smart tourism destination aims to improve both the visitor experience and the quality of life in the community by focusing on innovation and sustainability (Sanchez, 2016). Smart Tourism Destinations initiatives rely on a combination of hard and soft smartness elements. While the latter emphasizes recent advances in ICTs and the Internet of Things, both have enabled the collection and analysis of massive amounts of data, providing real-time insights into how people behave. Big data can help tourism destinations gain a competitive advantage (Encalada & o Ferreira, 2017). The fourth industrial revolution introduced a fresh method for maintaining smart sustainability. The design of smart cities and smart industries is progressively putting a focus on sustainability and resource efficiency. (Roblek et al., 2016). Smart technologies provide new features that transform the way products and services are designed, produced, delivered, and used. Radio-frequency identification tags, digital sensors, networks, and processors create the smart properties related to smart technologies that positively relate to sustainability triple bottom line, and thus offer enormous potential for developing new processes, experiences, organizational forms, and relationships (Saunila et al.,2019).

Through the selective integration of environmental and digital goals into entrepreneurial forms of urban governance, Martin *et al.* (2018) developed the concept of smart sustainability, which draws on smart city literature, as a framework to analyze tensions, contradictions, and conflicts within the environment-economy relationship at the urban scale.

2.2 Smartness transmission channels for sustainability

Basic mechanisms connecting smartness with tourism sustainability through the appropriate technology are the following (Perles Ribes & Ivars Baidal, 2018):

2.2.1 Planning and a long-term perspective

With the help of technology, a new scenario for tourism planning arises. However, this scenario should not be confused with a form of technocratic, apparently neutral planning that avoids the major sustainability planning concerns, such as the territorial tourism model and growth constraints(Perles Ribes & Ivars Baidal, 2018). Ali and Frew (2014) have presented a holistic overview of the ICT-Sustainable tourism field by conceptualizing it from a destination, consumer and business perspective and derived a collection of ICT-based tools for Sustainable tourism as presented in Table 1.

Table 1. Summary of ICT-based Tools and uses for Sustainable Tourism Development

ICT-based Tools	Uses for sustainable tourism
Carbon Calculator	Monitoring emissions for the benefit of visitors and the local community. Destinations may be able to attract eco-conscious travellers, resulting in economic benefits.
Community Informatics	Increases community participation in decision-making, empowers individuals, strengthens community identity, and creates opportunities for economic development.
Computer Simulation	To investigate the effectiveness of alternative management practises, issues that are too complex for direct observation, manipulation, or mathematical analysis are simulated. This results in better decisions on economic, natural, and sociocultural impacts, with realistic scenarios available to engage all stakeholders, including tourists, planners, and the local community.
Destination Management System	Facilitates the creation of platforms for promoting economic benefits to local communities, reducing socio-cultural tensions and negative impacts, and highlighting vulnerable ecosystems at destinations. DMS can also boost tourist engagement and satisfaction by providing relevant, easily accessible destination information.
Economic Impact Analysis Software	Information can be used to determine financial feasibility, select between alternatives, boost economic activity, and lobby for public support for tourism development.
Environment Management Information Systems	Environmental data such as tracking, waste monitoring, emissions, and cost/benefit analysis are analyzed in order to make better economic, natural, and sociocultural decisions.
Geographical Information Systems	Sustainable tourism indicators can be identified, defined, and measured. Data provided for modelling and evaluating suitable locations for proposed development.
Global Positioning System	Impacts on the environment can be managed and minimized by planning the spatial and temporal distribution of tourists using movement tracking.
Intelligent Transport System	Improved ground transportation systems make tourists more aware of their travel options at the destination, leading to increased use of public transportation, which benefits the local community by reducing traffic congestion at the destination and may reduce host-tourist antagonism.
Location Based Services	Tourists can be sent location-sensitive information to raise awareness and familiarize them with a destination's culture, heritage, and customs, increasing the

	likelihood of making sustainable in-trip choices. Additionally, information on promotions, places to visit, lodging, and other general information such as safety and security and weather can be provided. This may increase tourist spending and have a positive impact overall due to print reduction.
Tourism Information System	More high-quality information is now available to help destination managers make decisions by acting as a decision-support system.
Virtual Tourism	Virtual tours can act as a full or partial substitute for destinations that have reached their carrying capacity or are vulnerable in some way, such as by substituting for activities that are socially unacceptable, reducing traffic impacts, and so on.
Weather, Climate and Ocean Change Forecasting Software	This information can be used for event bidding, making development decisions, putting measures in place for hazards and risks associated with bad weather, providing tourists with up-to-date information, energy management, and other issues.

Source: (Ali and Frew 2014).

2.2.2 More efficient use of resources

The interconnection of sensors and technological infrastructures with a central information platform, the Smart destination operating System, which integrates various data sources (sensors, social networks, etc.) and permits the simultaneous use by various users, is how smart tourism destinations achieve higher levels of efficiency, reduction in consumption and waste, cost savings (Fyall & Garrod, 2020). With these upgrades, we may anticipate an equal or higher volume of visitors with less intense resource consumption and lower impact generation—in other words, a greater environmental sustainability of the destination (Perles Ribes & Ivars Baidal, 2018).

2.2.3 Monitoring system and effective management

An exciting possibility to enhance sustainability indicator systems and ensure their ongoing application and effective administration is provided by the technological possibilities for monitoring environmental and tourism factors (Perles Ribes & Ivars Baidal, 2018). A smart tourism destination with a modern infrastructure that ensures the area's sustainable growth is accessible to all, enhances visitors' interactions with and integration into their surroundings, and enhances the quality of their experience at the location while also enhancing the quality of life for locals (Kumar, 2020). Monitoring produces a massive amount of data, which has two main effects: the potential for using Big Data techniques and the opening up of the information in the form of Open Data, as a means of stimulating innovation in the information structures industry and ensuring transparency (Sorokina, 2019).

2.2.4 Public-private cooperation and open innovation

Commonly, public-private partnerships are utilized to encourage coordinated action at the destination level. The management of tourist attractions necessitates collaboration between numerous parties. An ongoing coordination center offered by a destination management organization (DMO) can enable and contextualize initiatives that boost the creativity and effectiveness of tourism in a region (World Tourism Organization, 2015). Governments, tourism organizations, local communities, tourists, and the environment were all embraced by smart tourism destinations (Lee et al., 2020).

2.2.5 Greater transparency and participation

The completion of a sustainable and inclusive urban development is fundamentally dependent on the participation of citizens. Consequently, it is essential to take into account the needs of the population when creating successful smart tourism destinations (Singh et al., 2021). According to many experts, citizen involvement is the key element of any smart city initiative. Because of this, decision-makers should be creative in how they connect with citizens (Berntzen & Johannessen 2015).

2.2.6 Customization of tourist services

By providing real-time information about travel destinations and hospitality services during the planning stage, improved access to real-time information to help tourists explore the destinations while on vacation, and engagement to relive the experience by demonstrating ancestry feedback after the trip, the smart tourism destination improves the tourism experience through information technology (Suanpang et al., 2021).

2.3. Destination appeal

Destination appeal refers to whether the quality of tourism products in a region satisfies tourists' needs for well-being such as mental relaxation and pleasure (Bo et al., 2016). The competitiveness of a tourism destination has been theorized to be influenced by destination appeal (Ndivo et al, 2012). Destinations incorporate a variety of factors that draw tourists and meet their needs. The following categories can be used to categorize these factors shaping traveler experiences and destination appeal: attractions, amenities, accessibility, human resources, image, and price. Their availability and quality will have an impact on the tourists' decisions to travel there for the first time and to return (Mandic and Pranicovic, 2019).

2.3.1 Attractions

All material and intangible elements that frequently draw visitors' attention and may serve as the initial inspiration for a traveler to visit a destination are collectively referred to attractions (Mandic and Pranicovic,2019). Tourism attractions have been more intellectualized and digitalized as a result of ongoing changes in information technology to become smart tourism attractions (Zhao et al, 2022). Eight major categories are included in the concept of smart tourism attractions: smart information systems, intelligent tourism management, smart sightseeing, e-commerce systems, smart safety, intelligent traffic, smart predictions, and virtual tourist attractions (Wang et al, 2016). ICTs make it possible to create tourist attractions, help with the planning and management of the visitor experience, and affect visitor behavior. It is acknowledged as a resource for material

processing, the restoration of the socio-cultural structure, and a way to strike a balance between the preservation of the environment and recreational activities (Mandic and Pranicovic, 2019).

2.3.2 Public and private amenities

The majority of the services and amenities that support visitor stays—including energy, transportation, public infrastructure, lodging, recreational opportunities, and visitor information—can be influenced by ICTs. ICTs (such as cell phones and social media) encourage the co-creation of new services, have an impact on emerging travel trends (such as self-organized travel), and increase demand for travel and attraction to specific places (Mandic and Pranicovic, 2019). The growth of cell phones and digital empowerment have successfully connected travelers' networks at home and abroad. Tourists typically utilize ICT and the Internet to expedite and improve their search for travel-related information and travel planning. Because it serves the varied and complex expectations of modern tourists, the use of ICT enhances, complements, and increases the competitiveness of a tourism location (Milicevic et al., 2020).

2.3.3 Accessibility

If a tourism destination can be reached through transportation and from multiple directions, it becomes accessible to the general public, including visitors (Mandic and Pranicovic, 2019). Smartphones promote a culture of information exchange and are seen as new distribution channels that have a significant impact on destination visibility by making information more accessible. Smartphones support a wide variety of travel information services that can be accessed at anytime from anywhere. By employing the virtual world paradigm to improve the destination accessibility of tourism products, for instance, they assist digital travelers in navigating and exploring numerous destinations (Wang et al., 2016).

2.3.4 Human resources

It is challenging to anticipate that technological advancements will offer a workable substitute for a human workforce given the importance of the personal touch in the tourist sector; although, ICT can help employees be more effective and competent. Staff members are expected to be well-trained because they play a part in the supply of tourist products and visitor experiences. Visitors' pleasure is significantly influenced by those working in tourist information centers. With a variety of different smart solutions like augmented and virtual reality, chatbots, Amadeus Destination, etc., their performances can be enhanced, particularly in the context of information provision and booking services (Mandic and Pranicovic, 2019). Technology won't replace face-to-face interactions with people; instead, it will be used to strategically improve human-led operations by giving staff access to ICT for better service and experience creation (Neuhofer et al., 2015).

2.3.5 Destination image

The tourism sector has undergone a radical transformation into a network of digitally enabled travel services because to technological advancements, particularly the introduction of smartphones and tablets. Additionally, smart device features enhance the

entire travel cycle. For instance, cell phones promote experience sharing among travelers, which increases visitors' awareness of services and goods and shapes how a destination is perceived (Mandic and Pranicevic, 2019).

2.3.6 Price

Pricing, which includes the cost of travel, lodging, attractions, food, and tour services, is a crucial component of a destination's competitiveness. By reducing costs through sustainable transportation, e-tickets to attractions, and revenue gains from better hotel operations, green hotels, and service delivery facilitation, ICT application has an impact on the costs of essential tourism items and the financial outlay of businesses (Mandic and Pranicevic, 2019).

Study Hypotheses

H1: Smart sustainability has a positive influence on destination appeal.

H1a. The environmental dimension of smart sustainability has a positive influence on destination appeal.

H1b. The social dimension of smart sustainability has a positive influence on destination appeal.

H1c. The economic dimension of smart sustainability has a positive influence on destination appeal.

3. Methodology

The research depended on the quantitative method. The study employed a questionnaire as an instrument for data collection. The questionnaire was distributed to the visitors of the Egyptian tourism destination either domestic tourists or foreign tourists. The questionnaire was designed based on previous studies to measure the smart sustainability practices in the Egyptian tourism destination and the destination appeal. Smart sustainability and its dimensions (environmental dimension, social dimension and economic dimension) were measured using 16 items adopted from Noy and Givoni (2018); Sanchez-Corcuera et al. (2019). Destination appeal was measured through 6 items depending on the studies of Mandic and Pranicevic (2019) and Bo et al (2016). The questionnaire was distributed in a simple random sample method, due to the large size of the population and its spread over a large geographical area. This type of sample depends on that each case of the study population has the same opportunity to choose within the study sample (El zek, 2020). The questionnaire was distributed in the governorates of South Sinai, the Red Sea and Cairo which represent the main tourist destinations in Egypt from July 2022 to October 2022. A total of 600 responses were collected. After eliminating samples with missing values, 400 were finally selected.

4. Results and Discussion

4.1 Validity and Reliability of the Study Instruments

The questionnaire was initially pretested for its validity with professors at tourism studies department at the faculty of tourism and hotels to get feedback regarding the clarity of the instructions and accuracy of the questions in the instrument. Comments and suggestions

obtained from the pre-test were used for rewording the instructions and layouts of the questionnaire. The Cronbach's Alpha reliability was computed and the tests showed that the reliability coefficients for all the items were above 0.60 which indicates that the instrument is reliable. For this study, Cronbach's alpha for all survey questions is presented in Table (2).

Table (2): Cronbach alpha for study instruments

No	Items	Cronbach's Alpha
1	Smart sustainability	.898
	- Environmental dimension of smart sustainability	.896
	- Social dimension of smart sustainability	.793
	- Economic dimension of smart sustainability	.825
2	Destination appeal	.768

4.2 Demographic characteristics of respondents

The questionnaire used for this study included many sections concerning the respondents' demographic characteristics and other relevant information. This information was useful in understanding the background of the respondents. Results of respondents' demographics and profile are presented in Table (3).

Table (3): Results of respondents' demographics and profile

No	Items	Freq.	%	
1	Gender	Male	239	59.8
		Female	161	40.2
2	Tourist Nationality	Domestic	236	59.0
		International	164	41.0
3	Age	Less 25 years	49	12.2
		25- 35 years	212	53.0
		36- 45 years	93	23.2
		More than 45 years	46	11.5
4	Income	less than500 \$	91	22.8
		500 \$ - 999 \$	132	33.0
		1000 \$ - 1499\$	95	23.8
		1500 \$ - 2000\$	56	14.0
		More than 2000\$	26	6.5
5	Education	High School	12	3.0
		Bachelor	269	67.2
		Master's degree	32	8.0
		Doctoral degree	17	4.2
		Others	70	17.5

6	Purpose of visit	Tourism	358	89.5
		Business	18	4.5
		Family visit	9	2.2
		Study	15	3.8

Data in table (2) indicated that, out of the 400 respondents, 239 of them (which represented 59.8% of the sample) were male and 161 of them (which represented 40.2% of the sample) were female. Regarding the nationality, the majority of tourists were domestic tourists with a percentage of 59 % against 41% for foreigners. The data indicated that tourists who are Less than 25 years were 49 (12.2%), 212 (53%) belong to the 25-35 years old category, 93 (23.2%) of the respondents were belong to the 36-45 years old category and more than 45 years were 46 (11.5%). This result might reflect that the most age segment was the 25-35 years segment. Regarding the monthly income, 91(22.8%) of respondents were less than 500\$, 132(33%) were between 500\$- 999\$, 95(23.8) were between 1000\$-1499\$, 56(14%) were between 1500\$-2000\$ and only 26(6.5%) were more than 2000\$. For education, most of the tourists have a bachelor's degree by 67.2%, followed by other degrees of education with 17.5%, followed by 8.0% with master's degree and 4.2% with doctoral degree and a high school degree with a percentage of 3.0%. Concerning the purpose of visit, 89.5 % of tourists came to Egypt for tourism which represent the large percent of respondents, followed by 4.5 % for business purposes, 3.8 % for the purpose of study and 2.2 % for family visits.

4.3 Respondents' attitudes towards the Egyptian destination's smart sustainability

Sixteen statements were used to measure respondents' attitude towards the smart sustainability in the Egyptian destination.

Table (4): Respondents' attitudes towards the smart sustainability

No.	Items	Mean	SD	Frequencies %				
				1	2	3	4	5
Environmental dimension		3.8143	.42958					
1	The Egyptian destination uses smart technologies in waste management like (sensors for waste containers).	3.78	.543	.2	3.0	18.0	76.5	2.2
2	The Egyptian destination uses smart technologies in Water management such as water tap sensors.	3.80	.550	.5	2.2	17.5	76.5	3.2
3	The Egyptian destination uses smart technologies for saving energy such as smart electronic key at hotels.	3.86	.503	.2	1.2	15.5	78.5	4.5

4	The Egyptian destination provides eco-friendly smart modes of transportation such as high-speed train and smart electric buses.	3.82	.548	.8	2.0	15.2	78.8	3.2
5	The Egyptian destination has smart road technologies such as smart traffic lights and digital signs.	3.84	.557	1.0	2.0	12.8	80.5	3.8
6	The Egyptian destination uses augmented reality for providing tourists with information about environmental sensitive areas such as protected areas.	3.80	.571	1.5	1.5	14.8	80.0	2.2
7	The Egyptian destination provide virtual tours to control carrying capacity of tourism sites.	3.81	.555	1.0	1.8	15.2	79.0	3.0
Social dimension		3.8569	.41357					
8	Smart sustainability enhanced the quality of life at the Egyptian destination.	3.86	.536	1.0	1.0	13.0	80.5	4.5
9	Smart sustainability enhanced public safety and security at the Egyptian destination.	3.85	.524	.8	.8	15.8	78.5	4.2
10	Smart sustainability creates job opportunities for local community at the Egyptian destination.	3.85	.511	.5	1.2	14.8	79.5	4.0
11	Smart sustainability helped the Egyptian community to access local services easily.	3.86	.533	.8	1.0	14.5	78.8	5.0
Economic dimension		3.8690	.38315					
12	Smart sustainability contributed to the reduction of tourism expenses at the Egyptian destination.	3.86	.508	.8	.8	14.2	80.5	3.8
13	Smart sustainability contributed to improve the competitiveness of the Egyptian destination.	3.89	.488	-	1.2	14.2	78.8	5.8

14	Smart sustainability contributed to increase economic growth at the Egyptian destination.	3.88	.505	.2	1.5	13.8	79.5	5.0
15	Smart sustainability contributed to improve the profitability at the Egyptian destination.	3.86	.494	.2	1.0	15.5	78.8	4.5
16	Smart sustainability contributed to increase tourism revenues at the Egyptian destination.	3.86	.501	.2	1.2	15.2	78.8	4.5
Smart sustainability		3.84	0.37					

The data in Table (4) indicate that the average mean of tourists' perception of smart sustainability in the Egyptian destination was 3.84 with a standard deviation value of 0.37. This means that the majority of the study sample agrees with smart sustainability statements.

4.4 Respondents' attitudes towards destination appeal

Six statements were used to measure respondents' attitude towards the destination appeal of the Egyptian destination.

Table (5): Respondents' attitudes toward the destination appeal

No.	Items	Mean	SD	Frequencies %				
				1	2	3	4	5
1	The Egyptian destination has a unique cultural and natural attractions.	4.09	.452	.5	.2	2.2	83.5	13.5
2	The Egyptian destination has a wide range of services and facilities that support visitors' stays such as utilities, transport, public infrastructure, accommodation, recreation facilities and visitor information	4.37	.627	.2	1.0	3.5	52.2	43.0
3	Travel information services about the Egyptian tourism destination can be accessed anytime from anywhere via internet.	4.10	.549	.8	.8	4.0	77.2	17.2
4	Human resources and staffs in the Egyptian tourism destination are efficient and professional.	4.29	.619	.5	.5	4.2	58.8	36.0
5	The Egyptian destination has a good Image and character in minds of its visitors.	4.21	.560	-	1.2	3.5	68.0	27.2

6	Prices of services in the Egyptian destination are fair.	4.22	.605	.5	.8	4.5	65.0	29.2
DA		4.21	0.38					

The data in Table (5) indicate that the average mean of tourists' perception of the Egyptian destination's appeal was 4.21 with a standard deviation value of 0.38. This means that the majority of the study sample agrees with destination appeal statements.

4.5 Correlation Analysis between smart sustainability and destination appeal

The results in Table (6) indicated that the sig. value is less than 0.05 which means that there is statistically significant correlation between smart sustainability and destination appeal. That means, increase or decrease in one variable do significantly relate to increase or decrease in the second variable.

Table(6): Correlations between smart sustainability and destination appeal

			SS	DA
Spearman's rho	SS	Correlation Coefficient	1.000	.224**
		Sig. (2-tailed)	.	.000
		N	400	400
	DA	Correlation Coefficient	.224**	1.000
		Sig. (2-tailed)	.000	.
		N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

This confirms the need to apply smart sustainability practices in tourist destinations, which in turn improve the tourist destination appeal.

4.6 Differences between Respondents' Demographics and other Factors with Regard to the Study Variables

Mann-Whitney test and Kruskal-Wallis test were used to test the differences between demographics with regard to the other variables (i.e. smart sustainability, and destination appeal). Mann-Whitney test used to compare just two independent samples, while Kruskal-Wallis test used to compare three or more groups (Mohamed, 2015). The two tests were used at a sig. level of 5%.

4.6.1 The differences between respondents’ perception to the study variables with regard to their nationality according to Mann-Whitney test.

Table (7): differences between respondents’ perception according to nationality

Variables	Nationality	N	Mean Rank	Mann-Whitney	Sig.
smart sustainability	Domestic tourist	236	195.72	1.822E4	.221
	International tourist	164	207.37		
Destination appeal	Domestic tourist	236	195.87	1.826E4	.325
	International tourist	164	207.16		

As shown in table (7) there is no significant difference between respondents’ perception of smart sustainability or destination appeal with regard to their nationality where the p values for all were above .05.

4.6.2 The differences between respondents’ perception to the study variables with regard to their gender according to Mann-Whitney test.

Table (8): differences between respondents’ perception according to gender

Variables	Gender	N	Mean Rank	Mann-Whitney	Sig.
smart sustainability	Male	239	196.87	1.837E4	.345
	Female	161	205.89		
Destination appeal	Male	239	200.51	1.924E4	.998
	Female	161	200.48		

As shown in table (8) there is no significant difference between respondents’ perception of smart sustainability or destination appeal with regard to their gender where the p values for all were above .05

4.6.3 The differences between respondents’ perception to the study variables with regard to their age according to Kruskal-Wallis test.

As illustrated in table (9) there is no significant difference between respondents’ age and the study variables where the p values were above .05.

Table (9): differences between respondents’ perception with regard to age

Variables	Age	N	Mean Rank	Chi-Square	Sig.
smart sustainability	less than 25 years	49	210.26	3.889	.274
	25-35 years	212	198.56		
	36-45 years	93	210.11		
	More than 45	46	179.60		
Destination appeal	less than 25 years	49	223.06	2.541	.468
	25-35 years	212	198.85		
	36-45 years	93	191.99		
	More than 45	46	201.29		

4.6.4 The differences between respondents’ perception to the study variables with regard to their income according to Kruskal-Wallis test.

Table (10): differences between income with regard to study variables

Variables	Income	N	Mean Rank	Chi-Square	Sig.
smart sustainability	Less than 500 \$	91	163.03	19.597	.001
	500-900 \$	132	209.84		
	1000-1499 \$	95	212.83		
	1500-2000 \$	56	218.59		
	More than 2000 \$	26	200.23		
Destination appeal	Less than 500 \$	91	167.02	13.151	.011
	500-900 \$	132	201.23		
	1000-1499 \$	95	215.62		
	1500-2000 \$	56	228.29		
	More than 2000 \$	26	198.90		

As illustrated in table (10) there is significant differences between respondents’ income and the study variables where the p values were (.001) for smart sustainability and (.011) for Destination appeal.

4.6.5 The differences between respondents’ perception of the study variables with regard to their education according to Kruskal-Wallis test.

Table (11): differences between educational level with regard to study variables

Variables	Education	N	Mean Rank	Chi-Square	Sig.
smart sustainability	High school	12	136.58	11.411	.010
	Bachelor	269	168.19		
	Master	32	180.50		
	PhD	17	115.09		
Destination appeal	High school	12	94.50	7.910	.048
	Bachelor	269	168.47		
	Master	32	158.92		
	PhD	17	180.97		

As shown in table (11) there is significant differences between educational level and the study variables, where the p values were below .05.

4.6.6 The differences between respondents’ perception to the study variables with regard to their purpose of visit according to Kruskal-Wallis test.

Table (12): differences between purpose of visit with regard to study variables

Variables	Purpose of visit	N	Mean Rank	Chi-Square	Sig.
smart sustainability	Tourism	358	201.41	7.575	.056
	Business	18	154.33		
	Family visit	9	187.00		
	Study	15	242.30		
Destination appeal	Tourism	358	200.01	2.808	.422
	Business	18	171.72		
	Family visit	9	223.22		
	Study	15	233.20		

As illustrated in table (12) there are significant differences between respondents’ purpose of visit and smart sustainability where the p values were .056 and destination appeal was an exception (p values = .422).

4.7 Effect of smart sustainability on destination appeal

4.7.1 Effect of the environmental dimension of smart sustainability on destination appeal

Table (13) depicts the Simple linear Regression analysis between the environmental dimension of smart sustainability and destination appeal. Results show that the

environmental dimension of smart sustainability affect the destination appeal by 18.3 % (Sig=.000).

Table (13): Effect of environmental dimension on destination appeal

Model	Unstandardized Coefficients		Standardized Coefficients	Adjusted R square	t	Sig.
	B	Std. Error	Beta			
1 (Constant)	2.726	.157		.183	17.324	.000
ED	.390	.041	.430		9.506	.000

* Dependent Variable: DA

4.7.2 Effect of social dimension of smart sustainability on destination appeal

Table (14) depicts the Simple linear Regression analysis between the social dimension of smart sustainability and destination appeal. Results show that the social dimension of smart sustainability affect the destination appeal by 11.6 % (Sig=.000).

Table (14): Effect of social dimension on destination appeal

Model	Unstandardized Coefficients		Standardized Coefficients	Adjusted R square	t	Sig.
	B	Std. Error	Beta			
1 (Constant)	2.966	.172		.116	17.258	.000
SD	.323	.044	.344		7.298	.000

* Dependent Variable: DA

4.7.3 Effect of economic dimension of smart sustainability on destination appeal

Table (15) depicts the Simple linear Regression analysis between the economic dimension of smart sustainability and destination appeal. Results show that the economic dimension of smart sustainability affect the destination appeal by 6.7 % (Sig=.000).

Table (15): Effect of economic dimension on destination appeal

Model	Unstandardized Coefficients		Standardized Coefficients	Adjusted R square	t	Sig.
	B	Std. Error	Beta			
1 (Constant)	3.174	.191		.067	16.625	.000
ECD	.268	.049	.264		5.466	.000

* Dependent Variable: DA

4.7.4 Effect of smart sustainability on destination appeal

The results in Table (16) depicts the Simple linear Regression analysis between smart sustainability and the destination appeal. Results show that smart sustainability affects destination appeal by 14.4 % (Sig=.000).

Table (16): Effect of smart sustainability on destination appeal

Model	Unstandardized Coefficients		Standardized Coefficients	Adjusted R square	t	Sig.
	B	Std. Error	Beta			
1 (Constant)	2.677	.187		.144	14.336	.000
SS	.399	.048	.383		8.260	.000

* Dependent Variable: DA

5. Conclusion

The study aimed to discover the impact of smart sustainability on destination appeal. The results demonstrated that the three dimensions of the Egyptian tourism destination's sustainability procedures are acceptable (environmental, social, and economic). If these practices are optimized, Egypt is said to have the potential to become a smart and sustainable tourism destination. This result was in line with the study of El zek (2020) which stated that the Egyptian tourism destination follows sustainable tourism development policies in a good way. Energy efficiency, water management, waste management, biological diversity protection, and cultural heritage preservation were the five key areas where sustainable tourism development was made in Egypt. The results also showed that the Egyptian tourism destination has a good level of destination appeal by having the basic features that help to distinguish and compete with other tourism markets such as unique cultural and natural attractions, a wide range of services and facilities that support visitors' stays such as utilities, transport, public infrastructure, accommodation, recreation facilities and visitor information, accessed information at anytime from

anywhere via internet, efficient and professional human resources and fair prices of tourism products and services.

The results showed that there is a positive relationship between smart sustainability in its three dimensions (the environmental dimension, the social dimension, and the economic dimension) and the Egyptian tourism destination's appeal. This result was in line with the study of Novianti et al. (2022) which emphasized that the use of smart tourism technology has a direct impact on travelers' attitudes, subjective norms, and perceptions of their ability to manage their conduct. Rafdinal et al. (2021) confirmed that visiting tourism destinations is influenced by travel intention that is influenced by smart tourism technologies that affect the attitude of tourists. Mandic and Pranicevic (2019) stated that the adaption of technological solutions in tourism industry can be related to increased productivity, profitability and quality of services. Additionally, ICTs facilitate visitor decision through (online distribution channels and information accessibility), influence overall travel experience and enable the sharing of visitors' impressions.

In light of the research results, the researchers suggest that The Ministry of Tourism and Antiquities should strengthen the development of Smart Tourism Destinations to increase Egypt's competitiveness as a tourism destination around the world. For additional investigation, researchers can also develop the concept of smart sustainability to incorporate other ideas about smartness such as those linked to education and economic competence. Also, the impact of other technological innovations such as block chain, artificial intelligence, and machine learning on tourism development.

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أثر الاستدامة الذكية علي جاذبية المقصد السياحي

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الملخص العربي

أدى ظهور المدن الذكية والمقاصد السياحية الذكية في السنوات الأخيرة إلى ظهور توقعات جديدة لاستدامة المقاصد السياحية من خلال الاعتماد علي التكنولوجيا الحديثة. إن تطور تكنولوجيا المعلومات والاتصالات قد غير بشكل كبير صناعة السياحة من خلال التواصل المادي بين الأشياء. تُستخدم الاستدامة الذكية للتعبير عن مفهوم استخدام التقنيات الذكية لتحقيق إدارة فعالة للأنشطة السياحية في المقاصد السياحية التي تزيد من استخدام الموارد وتحقق الفوائد البيئية. هدفت الدراسة إلى تقييم تأثير الاستدامة الذكية على جاذبية المقصد السياحي. تم جمع البيانات من ٤٠٠ سائح من خلال استبيان تم توزيعه في مدن سياحية مختلفة في مصر. وأظهرت النتائج أن هناك علاقة إيجابية بين الاستدامة الذكية بأبعادها الثلاثة (البعد البيئي ، البعد الاجتماعي ، البعد الاقتصادي) وجاذبية الوجهة السياحية المصرية.

الكلمات الدالة: تكنولوجيا المعلومات والاتصالات ، المدينة الذكية ، المقصد السياحي الذكي ، الاستدامة، جاذبية المقصد السياحي.