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Can Smart Technologies Enhance Heritage Tourism?
The Case of El Montazah Gardens-Alexandria-Egypt

هل تستطيع التكنولوجيا الذكية ان تثري سياحة التراث ؟
حالة حدائق المنتزة – الاسكندرية – مصر

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Abstract

In the era of digital transformation, smartness of tourist destinations became a necessity. The current study presents a number of innovative solutions and outcomes of managing heritage tourism of Alexandria sustainably. It investigated stakeholders' perceptions of the potentials of the digital transformation of El Montazah Gardens as one of the iconic heritage destinations of the old city. It adopted The City Model Canvas (CMC) as a planning tool for proposing a new model as an action plan for transforming El Montazah gardens into a smart heritage destination either for the botanic or the built heritage. The proposed model was named Destination Management Canvas (DMC), and it goes beyond smart applications on-site for representing the attractions to smart management of heritage tourism in a sustainable manner while respecting nature and culture. The implementation of the conducted study requires an integrated vision towards local development and the inclusion of all stakeholders. The results indicated to the easiness and trust in the application of smart technology with a positive attitude towards the application and its positive economic, social and environmental outcomes. The application of the new proposed model could be a tool guide for heritage managers and local authorities to implement the applications of the following smart technologies; virtual reality (VR), augmented reality (AR) and Internet of Things (IoT) with low cost tools for a smart heritage tourist destination

Keywords: Digital Transformation; Smart Technologies; Internet of Things (IoT); Heritage Tourism; El Montazah Gardens.

معلومات المقالة

لغة المقالة: الإنجليزية

الملخص

في عصر التحول الرقمي ، أصبح ذكاء الوجهات السياحية ضرورة. تقدم الدراسة الحالية عددًا من الحلول والنتائج المبتكرة لإدارة السياحة التراثية للإسكندرية بشكل مستدام. وقد بحث في تصورات أصحاب المصلحة عن إمكانات التحول الرقمي لحدائق المنتزه كواحدة من الوجهات التراثية الشهيرة في المدينة القديمة. واعتمدت مخطط نموذج المدن كأداة تخطيط لاقتراح نموذج جديد كخطة عمل لتحويل حدائق المنتزه إلى وجهة تراثية ذكية سواء للتراث النباتي ، أو المبني. سمي النموذج المقترح مخطط نموج المقاصد؛ ولا تقتصر التطبيقات الذكية المقترحة علي مجرد عرض عناصر الجذب في الموقع، بل يتعدي الامر ذلك نحو الإدارة الذكية لسياحة التراث بصورة مستدامة مع احترام الطبيعة، والثقافة. يتطلب تنفيذ الدراسة التي تم إجراؤها رؤية متكاملة للتنمية المحلية وإشراك جميع أصحاب المصلحة. وأشارت النتائج إلى السهولة، والثقة في تطبيق التكنولوجيا الذكية، مع التوجه الإيجابي نحو التطبيق ونتائجه الاقتصادية، والاجتماعية، والبيئية الإيجابية. يمكن أن يكون تطبيق النموذج الجديد المقترح بمثابة دليل أداة لمديري التراث، والسلطات المحلية، لتنفيذ تطبيقات التقنيات الذكية التالية ؛ الواقع الافتراضي، والواقع المعزز بالخيال، وإنترنت الأشياء وذلك بأدوات منخفضة التكلفة لوجهة سياحية تراثية ذكية.

الكلمات الدالة: التحول الرقمي؛ التكنولوجيا الذكية؛ انترنت الأشياء ؛ سياحة التراث؛ حدائق المنتزة.

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Introduction

In the recent years of the digital era, sustainable management of cultural heritage destinations is a complex process because it requires preservation of the authenticity with innovation of services provision and this can be derived from smart technologies (Katsoni & Ona,2018; Snis, Olsson & Bernhard,2021).Despite the positive impacts of the digital transformation and using smart technologies on visitors' experiences, behaviors and expectations in heritage tourist destinations ; However, the studies about this interrelationship are still limited (Angelidou,2017; Buonincontri & Marasco,2017;UNWTO,2018).The recent studies of smart heritage in the destinations are about two dimensions ; the first is about the management of heritage buildings (Ryan,2005;Maksimović & Ćosović,2019),and the second is about the management of heritage-based cities (Boes, Buhalis & Inversini,2015; Riganti ,2017; Branchi, Valdivielso&Matías,2017; Snis, Verma&Shukla,2019; Olsson&Bernhard;202). So that the current study chose to investigate some of the applications of the suggested smart technologies in El Montazah Gardens as a heritage destination. The objective of the study is maximizing the expected benefits of applying smart technologies such as, Virtual Reality (VR), Augmented Reality (AR) and Internet of Things (IoT) in the selected case. The study proposed an action plan based on The City Model Canvas (CMC) which is grounded on Business Model Canvas (BMC) and it was named Destination Model Canvas (DMC). The study asks two questions; what are the appropriate smart tools and applications for El Montazah Gardens? And what are the expected outcomes of applying these smart technologies for heritage tourism in such a heritage destination? This exploratory study clarifies for the researchers, heritage managers and tourist developers the possibilities of the gradual digital transformation of Alexandria to become a smart based - heritage destination using a configured Business Model (BM) (Perelygina, Kucukusta & Law,2022). It could ialso enable practitioners and researchers to have the basis for incorporating smart heritage tourism objectives in sustainable urban development.

Literature Review

Smart city and Smart destination.

Smart technologies have actually changed tourism industry starting with global distribution systems (GDSs). In the era of digitalization, many traditional tourist destinations could be transformed into smart tourist destinations as a part of the smart world. smartness ensures the efficient and competitive management practices of the destination, governance thus an inclusive and sustainable tourism development (Ryan, 2005; Wayne, 2016; Riganti, 2017;Perelygina,Kucukusta&Law,2022).Smart environments depend on communication between devices, sensors, networks, servers for the fixed infrastructure with numerous tools such as mobile devices and interactive maps used by visitors (EL Jemeli,2019; Ben Deredi, & Abd EL Hak, 2019). Smart tourism arouses as a subset of the smart city concept for provision of high quality of life for citizens, competitive tourist services and effective and innovative solutions for all other stakeholders such as government, other public- and private tourism sector entities. There are three components of smart tourism; Smart experience, Smart business and ecosystem (Buhalis & Amaranggana, 2014; Khan, et.al.2017; Ba Ahmed, & Ben Zekwa,2019; Mostafa,2019). There are five factors of the successful smart destinations; ICT, innovation, creativity, human capital, and ability for signification of the attractiveness of tourist products and service. There are also five dimensions of the smart destination's leadership, innovation, social capital, technology and governance (Boes, Buhalis, & Inversini,2015). Lopez de Avila defined smart tourist destination as "an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increasing the quality of the experience at the destination and improves residents' quality of life "(Lopez de Avila,2015).for instance, mobile applications, social media, virtual reality (VR) and augmented reality (AR), have offered opportunities for enhancing tourist experiences (Mandic & Kennell,2021; Fan, Jiang & Deng,

2022).in addition, FieldMap is one of GIS programs designed to get and share rapid data (Ryan,2005). There are also applications of domestic transportations and smart parking spots that enable tourists to choose the fastest and cheapest ones with low CO2 emissions (Timeus, Vinaixa & Pardo-Bosch, 2020). The study of Abidin, Scarles &Lundberg (2023) proposes an evidence that digital collaboration among stakeholders is essential for micro-DMOs, through transforming their current websites into digital platforms through marketing, networking and knowledge sharing (Abidin, Scarles & Lundberg,2023) .For collaborative and participatory management The City Model Canvas (CMC) which is based on the Business Model Canvas (BMC) for firms, can also be used as a planning tool for smart destinations with economic, environmental and social outcomes which indicates for sustainable tourism development (Timeus, Vinaixa & Pardo-Bosche ,2020 ; Giourka,et.al.,2019). The City Model Canvas (CMC) is the most used business model in the planning of smart heritage cities in three fields; first is about the strategic context, which is related to the strategic priority in implementing the smartness among the heritage destinations. Second is related to the management and governance, which refers to the responsible entities for the management of the heritage services and third is for other related services. One of the most used technologies in tourism industry is the internet of things (IoT), in which data are communicated through wired and wireless connections and everything is inter-connected. The Internet of Things (IoT) connects the objects of everyday life by connecting devices through internet and sharing their information online to evaluate the offered public / tourist services for citizens and tourists (Car, Stifanich & Simunic, 2019; Wise & Heidari, 2019).

Smart technologies and heritage tourism

According to UNESCO, tangible Cultural heritage includes movable cultural heritage, immovable cultural heritage and underwater cultural heritage and natural heritage with cultural characteristics. UNESCO defined natural heritage as "natural features, geological and psychographic formations and delineated areas that encompass the habitat of threatened species of animals and plants and natural sites of value from the point of view of science, conservation and natural beauty; It includes public or private protected areas, zoos, aquaria and botanical gardens, natural habitat, marine ecosystems, sanctuaries and reserves" (UNESCO,2009).These natural and cultural assets have a crucial importance for tourism and many tourist activities are dependent on those assets. In other words, heritage tourism is related to traveling to experience such places and activities which represent the stories and identity of a particular group of people significant to the past and present. It also includes unique historic, cultural and natural attractions (ctmainstreet.org; americansforthearts.org). The integration of heritage elements into contemporary life is linked to the existence of smart technologies. Smartness in the context of heritage tourism has different meanings and functions ;It is a driver for achieving the sustainable development approach not only for the conservation purposes but also for interpretation and enhancement of heritage buildings, heritage sites and botanical gardens (univeur,2014;Buonincontri & Marasco,2017; interregeurope.eu,2020;destinet.eu).Previously, the smart technologies were limited to displaying heritage with virtual reality and augmented reality using sounds, lights and graphic techniques. In augmented reality there's a new perception of the real heritage site but in the virtual reality everything is not real and it is about computer generated sensory data (Khalil, 2014). Currently, smartness became about using technology for better decision making and management not only indoor for heritage buildings but also outdoor for heritage sites and natural landscape. For example, In Australia, heritage Building Information Model (BIM) was a great continuous tool for documentation, preservation, restoration and building information management exchange for interior and exterior of the Royal Exhibition Building. The used spatial data was collected by using aerial laser scanning, territorial laser scanning, Zeb scanning, and photogrammetric (Khoshelham,2018; Lopez, et.al.2018; Baik,2021). (IoT) has an importance for the management of the smart towns and monitoring, revitalization and preserving the heritage environments as well as for improving the heritage tourist experience. As a result, smart technologies can help in reshaping of heritage tourism supply, demand and impacts, proposing strategies in co-operation with

stakeholders for a new heritage tourism product and practices (Maksimović & cosovic, 2019; UNESCO, 2019). In other words, smartness underpins infrastructure, improves city's function and stimulates sustainable economic social, cultural, environmental, governance and urban tourism development. Consequently, it could enhance the four dimensions of tourist experience that identified by Pine and Gilmore 1889, entertainment, Esthetic, Education and Escapism. Consequently, it has implications for the marketing and attractiveness of the heritage destinations (Angelidou et.al.2017; Buonincontri & Marasco,2017; Radej, Pirkovic & Pierre,2018) . In addition, smartness can provide tourism businesses with innovations in terms of market researches, demand forecast, patterns of consumption, etc. (Mostfa, N,2019). Planners should evaluate the different types of technology and their tools and strategies. In other words, if they are suitable the destination competitiveness, entrepreneurship will be increased either the digital transformation is gradually for a district or a street or for the entire destination at once (Branchi Liceaga , & Matías2020). In an old city like Barcelona, cultural heritage is a vital component of tourist product and the selected smart applications are various such as interactive tourist attractions maps and smart mobility applications. On the other hand, the smart London is planned collaboratively for citizens as well as visitors. As well, Internet of Things (IOT) was used for the preservation of the Old Orthodox Church complex situated in Sarajevo. In this case the remote sensing ZigBee network system for monitoring cultural buildings has been developed for protecting cultural heritage from deterioration in terms of climate controlling (Eauropean Commission,2022). Sensors were used in order to monitor climate control system and its effect on the preservation of Dormition Cathedral buildings and their contents in Moscow, Russia in terms of monitoring temperature and humidity and this will facilitate exchanging information among all stakeholders and a better management heritage destination (Khoshelham,2018; Maksimović & Ćosović,2019; Angelidoua, M. & Stylianidis, E.,2020)

El Montazah Gardens

El- Montazah site was developed in the 19th and 20th centuries for the summer residence of the royal family in Egypt. Khedive Abbas Hilmi, fascinated by the natural beauty of the site especially in the summer, decided to build the Salamlek in 1892. Then King Fouad, in 1927, built the Haramlek, and King Farouk added the Tea Pavilion and bridge. After the 1952 revolution, the gardens and the beaches were opened to the public. An Italian company developed and managed the site and its beach cabins, while the royal residences were transformed into a hotel after the construction of Palestine Hotel in the 1960s, and entertainment facilities such as clubs and cafes were added. Most of the site was for Egypt's elite society until 2019 as The Egyptian President Abdel Fattah El-Sisi issued Presidential Decree No. 157 of 2019 forming a committee to develop EL Montazah Palace area in Alexandria Governorate, headed by Engineer Sherif Ismail, Assistant to the President of the Republic for national and strategic projects. The project aims to take advantage of that distinct area owned by Egypt and develop it to match the major international gardenss and turn it into a new destination for the international tourism (Awad,2014; Abdel-Rahman,2017; The Official Journal,2019).The project included the restoration of the pavilion, the tea island, the establishment of an international yacht marina, the development of the royal gardens, the development of archaeological buildings, the development of King Farouk's yacht museum (Fakhr al-Bahar), the development of the Salamlek Palace Hotel, raising the number of the hotel rooms from 225 to 926, implementation of four lakes and three exhibition and a conference center, tropical garden construction, hanging garden construction. It also includes the development of the beaches and implementation of modern sustainable irrigation systems using clean energy. The project aims to the re-planning of the site in order to be ready to receive both international and domestic visitors. It is intended to be an international heritage destination that is redeveloped consistent with the authentic identity of the area. Finally, Mr. President has primarily inaugurated the project in December, 2022.

Methodology and study instruments

The objective of the conducted study is to propose a model as an action plan for the possible uses of selected smart technologies in a suitable heritage destination. In order to accurately choose the research focus in which the selected technologies could be implemented; the researchers selected EL Montazah Gardens according to the following reasons; first; it is considered a natural/cultural heritage tourist destination. Second, there is a project of development currently conducted without a radical change in the infra-structure. Finally, the researchers asked for the consultancy of Information systems professors in Alexandria University about the suggested research focus and they all accepted the suggestion. The study used the qualitative approach due to the relative modernity of the smartness concept in Egypt. Snowball sample was chosen, in which, the researchers ask for the assistance of some participants to recruit the rest of the sample (see table. 1). It is about investigating the hidden participants in a cost-effective manner and a very little planning is required to collect the primary data (Johnson, 2014; Naderifar, Goli and Ghalijaei,2017). The study used the semi-structured interview in order to gain and realize a reliable and beneficial data. The form included five parts; first, the warm-up part that explained the study objectives whereas the second was for the demographics. Third part was about evaluating the ease of use of the smart technologies in El Montazah Gardens. The fourth was for evaluating the expected outcomes of the implementation. The following section was for evaluation of trust of the technologies and finally the last one for evaluating the respondents' attitudes for applying the technologies. The design of the question was dependent on Technology Acceptance Model (TAM) which evaluates the behavioral intention about using the technology (Guler,2017; Branchi, Liceaga, & Matías,2017; Lin, Juan & Lin,2020,). Most of the interviews were Face-to-Face and the rest were over telephone and all interviews were conducted in Arabic. The duration of the seventeen interviews ranged between twenty and thirty minutes.

Table (1) Members of the snow ball sample (Stakeholders)

No.	Sample members' jobs	Organization
1	Manager of General Administration of Strategic management	General Administration of Strategic management, Ministry of Tourism and Antiquities
1	Manager of Crisis management	General Administration of Strategic management, Ministry of Tourism and Antiquities
1	Manager of Information systems administration and digital transformation	Information systems administration and digital transformation, Ministry of Tourism and Antiquities
1	General manager of Alexandria district (Islamic archeology)	Ministry of Tourism and Antiquities
1	Tourism specialist	Information systems administration and digital transformation, Ministry of Tourism and Antiquities.
1	Deputy Manager of the Cultural Heritage Administration.	Cultural Heritage Administration, Alexandria Governorate General Office
1	Tourism Specialist.	The Central Administration for Tourism and Resorts, Alexandria Governorate General Office
1	An employee at the Cultural Heritage Administration.	Cultural Heritage Administration, Alexandria Governorate General Office
1	Deputy Manager of the General Administration for Planning and Follow-up.	The General Administration for Planning and Follow-up, Alexandria Governorate General Office
1	An employee at the General Administration of Planning and Follow-up.	The General Administration for Planning and Follow-up, Alexandria Governorate General Office

1	An employee at the General Administration of the Information and Documentation Center.	the General Administration of the Information and Documentation Center, Alexandria Governorate General Office
1	Computer Department employee	Alexandria Governorate General Office
1	An employee at the Gardens administration.	Gardens administration at Alexandria Governorate General Office
1	An employee in the Gardenss Department.	the district of Al-Montazah, Alexandria Governorate
1	Financial manager.	Al-Montazah Company for Tourism and Investment
2	Accountant and Administrative employee.	Al-Montazah Company for Tourism and Investment

Source: The researchers

Results and discussion

The sample members of the employees and managers of the Ministry of Tourism and Antiquities agreed that it is easy to use smart applications inside EL Montazah Gardens area, whether with regard to managing heritage buildings with some minor changes in the infrastructure, especially with a clear action plan to determining the capacity in relation to the gardens or Buildings, in addition to the use of some technological applications to present the history of the entire region, such as applications of augmented reality or virtual reality. They also unanimously indicated that there are a number of expected benefits of smart applications in the region, as they stressed the expected contributions for better management of the cultural and natural attractions in the region. In addition, this will enrich the tourist experience. They emphasized their trust in the importance of using smart applications to make administrative decisions appropriate to the nature of the area and its heritage elements. Therefore, they stressed the need to include smart technologies in the development plan of the gardens but their attitudes were not sufficiently positive towards the possibility of gradual application of smartness inside the city of Alexandria. The Manager of the Strategic General Department, Ministry of tourism and antiquities, indicated that he was asked by Al-Montazah Company for Tourism and Investment to put the development plan and it was presented to the Presidency, so that the tourist path for the tour was set within the area. The plan also included the re-planning of the Abu Qir train area, especially with regard to the old train garage, which is one of the forms of industrial heritage (Khalil & Elgohary,2020). Due to his interest in cultural itineraries and being the national coordinator of the National Project of the journey of the holy family in Egypt, he has set up an itinerary for the tour inside the gardens area that includes the history of the chalets and Palestine Hotel with the use of an indicative plan. The plan also included the construction of two hotels in the front of the main door of the gardens confronting the sea, a yacht port linking El Alamein and Alexandria and a restaurant for VIPs. The Manager of the Information Systems and Digital Transformation Department at the Ministry, who holds a master's degree in digital documentation from France and was a partner in the smart management of the Notre Dame Palace and the use of virtual reality technology and augmented reality for imagination, had a positive attitude for implementing many smart technologies in the conducted case. The Director of Crisis Management at the Ministry, who was graduated from tourist Guidance, stressed the importance of using more than one application of smart technologies, whether in the management of built heritage or the botanic gardens, while preserving the nature of each element of heritage. A tourism specialist in the management of information systems, Ministry of tourism and Antiquities, who holds a PhD, confirmed that it is expected that revenues will increase as a result of the use of smart applications, which enhances the sustainable development of the region. The sample members in Alexandria Governorate General Office stressed the importance of applying smart technologies in EL Montazah Gardens for enhancing the heritage tourism with a unique tourist experience. The Deputy Central Administration for Planning and Follow-up explained that it is necessary to have a clear action plan for implementing smart technologies and the maximum possible benefit for each of the management of heritage sites while providing more quality services for tourists. She emphasized that modern technology plays an important role in supporting planning and follow-

up departments and it works to increase the effectiveness and efficiency of the investment plans for the governorate of Alexandria, and it also clarified that the general office of the Alexandria governorate is not responsible for the development plan to EL Monatzah , but it considers the necessity of having clear criteria for choosing the technology used in the development process. An employee in the General Administration of Planning and Follow-up confirmed that the administration is responsible for assembling the investment requirements for the revival of Alexandria governorate and merging them into a single investment plan for the governorate as a whole and submitting it to the Ministry of Local Development, which in turn allocates the financial resources needed for the governorate, and sees the importance of using ICTs in setting , Implementation and follow-up of tourism development plans, as they help a lot in the process of forecasting and evaluating the current development conditions, especially in heritage areas. The Deputy of the Cultural Heritage Department in the Alexandria Governorate indicated the importance of smart technologies in supporting the visual identity project in the Alexandria Governorate. He also stressed the importance of EL Montazah gardens as they are an integral part of the cultural heritage of Alexandria Governorate, and one of the most important basics of preserving the civilizational and cultural heritage is the use of smart technology in managing the capacity of EL Montazah gardens with the use of virtual reality applications to enhance the tourist experience and provide all services in a smart way such as entry services Waiting, entertainment services, transportation services, digital documentation of heritage, and even the provision of cultural information, which reflects positively on the cultural experience of the tourist. The employee in the Central Administration for Tourism and Resorts clarified that the responsibility for developing EL Montazah gardens does not fall within the responsibility of the Central Administration for Tourism and Resorts, Through his experience in planning and following-up tourism projects in Alexandria, he stressed that the presence of effective smart tools in collecting, processing and evaluating reality information which is one of the most important elements for the success of tourism plans, as it is an vital element for preserving the heritage environment and one of the most necessary tools for feedback. From the constantly changing trends and desires of tourists, it is one of the mechanisms to address the emergency changes that occur in the plans. While both the employee in the General Administration of the Information and Documentation Center in Alexandria Governorate and the employee in the Computer Department agreed that modern technology is an integral part of the administration at the present time, but the technological situation in Alexandria does not include any smart technology, whether in the infrastructure or in the administrative procedures, however, there is a clear trend in the governorate to use ICT to provide civil services to citizens through the smart center to serve citizens. There are also some basic electronic programs in data analysis and decision support, and they are mainly found to support the Alexandria Governor's Office. On his question about the possibility of applying smart systems in the gardens, he explained that the proposed technology can be applied, but within a realistic framework that is commensurate with the available material and technological capabilities in the district knowing that many of smart technologies are inexpensive but it must be integrated within the framework of a clear plan to determine the ways to exploit it and take advantage of it. The views of both the employee in the central administration of gardens in the governorate of Alexandria and the administrative employee in the administration of the gardens of EL Montazah confirmed that the responsibility for maintaining the green areas in the gardens is not affiliated to the district of EL Montazah from the ground up. The responsibility of the central administration of gardens is to preserve the trees and the green areas in the Alexandria governorate as a whole, increase the green area in the governorate and removing any remnants that distort the gardens within the governorate, while providing plants, flowers, and trimming trees to decorate and beautify the governorate's fields. Beautifying the fields is the responsibility of EL Montazah district. In the context of the management of gardens, both respondents confirmed that there are no smart tools in preserving gardens, but smart irrigation methods can be used to provide water for irrigating trees and plants. The financial employee of EL Montazah Company confirmed that the development of EL Montazah gardens is no longer affiliated to EL Montazah Company, but the development plan was developed by the Presidency. From the accounts employee and an administrative employee at EL Montazah Investment and Tourism Company, they

all stressed the importance of smart applications in supporting the cultural heritage and strengthening the management of the gardens.

Implications

The current study is proposing a framework for El Montazah Gardens that is based on City Model Canvas (CMC) which is also founded on Business Model Canvas (BMC). The proposed model is a modified version of City Model Canvas (see appendix) in order to be used for the tourist destinations and it was nominated Destination Model Canvas (DMC) (see fig.1). The proposed model comprises a set of tourist activities, resources and processes either through cooperation with partners, tourist suppliers or tourists and visitors as customers. It is intended to be a managerial tool for smart transformation of the current heritage destination (Perelygina, Kucukusta & Law, 2022). The internet of things (IoT) is one of the selected technologies for connecting devices with a central server for sharing their information online in order to offer new opportunities for the selected case. IoT could enable accessibility for and interaction with a wide variety of information for several fields such as domestic transportation, tourist attractions, sightseeing, shopping and accommodation. IoT will need to integrate social media, and wearable devices. In addition, IoT has its potential for smart heritage cities and thus for destinations and their organizers and stakeholders especially in this emerging smart tourism paradigm. In order to implement the suggested uses of IoT in the current case (see table.2), WI-MAX network should be existed for broadband connections either for tourist services providers such as cafes, restaurants, malls or the businesses of the key partners mentioned in the new model. It will be useful for data ingestion, transmission, processing, visualization, analysis and prediction of demand in the circumstances of the international tourist market (Wise & Heidari,2019; Car, Stifanich & Simunic ,2019).

Table (2) Types of smart technologies and the related suggested tourist services and activities

Technology and applications	**suggested tourist services /activities/importance**
Internet of Thing (IoT)	
Geo-location technologies Depending on GBS tracking	Smart parking Outdoor heritage tours (see table.3)
Near field communication (NFC)	Smart payment e-Ticketing
virtual queue system	Indoor/outdoor Visitor management and managing carrying capacity e- reservation
Navigation system with beacons (Bluetooth)	Indoor heritage tours (see table.3)
Smart irrigation	Reducing water loss
Smart lighting system	reduce the amount of electricity and save energy
Smart garbage	Waste management Reduction of CO2 emissions
QR code	Interpretation of (the heritage/scientific aspects of botanic gardens –the built heritage)
Virtual reality (VR) technology	
Smart signage (info. sign board)/touch screen	Indoor/outdoor information provision and guidance
Augmented Reality (AR)	
virtual avatar	Virtual tour guide (indoor/outdoor)
Hologram	Indoor/outdoor Revitalization of history of Mohamed Ali Family Music concerts for old singers

Source: The researchers

Table (3) Heritage elements classification and suggested heritage tours in EL Montazah gardens

Heritage type	Heritage element	classification	Suggested tour
Natural heritage	**The gardens**	**Botanic gardens**	**Botanic heritage tour**
Cultural heritage	El Salamlek	**Heritage hotels**	**Heritage hotels tour**
	Palestine hotel		
	Workshops and company offices	**Other built heritage**	**Industrial heritage tour**
	The windmill		
	The water reservoir		
	The lighthouse		
	The clock tower		
	The bridge		
	The yachting marine		**Marine heritage tour**
	Tea island		
	Tea pavilion		**Vintage tour**
	The gambling casino		

Source: The researchers.

All the suggested heritage tours in table (3) could be implemented with a tour guide indoor (palaces/ heritage hotels or other built heritage and outdoor (using all the mentioned applications of the technologies in table (2). It is worth noting that there are some archeological remnants of the Egyptian and Greaco-Roman period inside the area of the botanic gardens which could be interpreted by the tour guide during the botanic heritage tour.

1-Mission achievement

The Destination Model Canvas (DMC). Enhancement of smart heritage tourism in El Montazah Gardens

6- Key Partners

Presidency.

- Alexandria governorate.

-Ministry of Tourism and Antiquities.

-Large or SMEs for data management.

-ELMontazah of tourism and investment.

-Alexandria University.

7- Key Activities

-Multiple uses of Internet of Things (IoT).

-Applications of Augmented reality (AR)

-Applications of Virtual Reality (VR)

8- Key Resources

- Creation of a control room to manage the region (utolities, smart transportation, security, tourist services etc…).

-Improvement of usage open data policy.

-Tourist Demand management platform

2-Value Propositions

- - Conservation of natural/cultural heritage.
- Innovation of tourist services provision.

- Improving integrated, strategic, management among stakeholders.

- Offering secured, controlled, well processed, trusted and monitored data.

- Enriching tourist experience/ Awareness.

- Optimizing decision-making.

4- Buy-in & support

- Public organizations (e.g. Ministry of Communications and Information).

- Private enterprises.

- Sponsors

5- Deployment

-Smart ICT --platforms.
-High speed wireless/wired connections.
-Improved communication system.
-Access to shared data among partners

3- Beneficieries

- Alexandria governorate.
- Local community.
- Data management enterprises.
- Visitors and tourists.
- Authorities of Antiquities.

9- costs

-Costs of purchasing and installing smart applications of technologies and tools.

-Moderate cost of developing new ICT infrastructure.

-Cost of maintaining and operating new infrastructure.

-Demand side management platforms.

- No social costs.

Sustainability outcomes

-New tourist revenue stream
-Energy Savings from smart lighting /irrigation systems.
-New tourist market segments (environmentally sensitive tourists, smart tourists)

- Saving energy/Reducing carbon emissions
- Social benefits (national pride/loyalty- asserting Cultural Identity of the Alexandrians)

Figure (1) Destination Model Canvas (DMC)
Adapted by the researche

Conclusions, Recommendations and future studies

In order to capitalize on the strengths of a heritage destination, tourism stakeholders should give prominence to smart technologies. The current exploratory study proposed a new model for EL Montazah gardens as a heritage destination and it was named Destination Model Canvas (DMC). It was designed for the digital transformation for such a heritage tourist destination while preserving its authentic identity. It presented an integrated vision with the inclusion of stakeholders' perceptions about the implementation of the digital transformation of El Montazah Gardens. This was by adopting The City Model Canvas (CMC) as a planning tool for proposing a new action plan depending on the multiple uses of the smart technologies of the virtual reality (VR) ,the augmented reality (AR) and the Internet of Things (IoT).The study modified the model for being more suitable for heritage destinations and could be used by heritage authorities in order to implement a comprehensive sustainable heritage tourism development covering the 9th and the 11st Sustainable Development Goals (SDGs) directly and the 13th and the 15th indirectly . The results indicated to the positive attitude, easiness and trust of the stakeholders in the application of smart technologies and consequently positive outcomes of their business management. The promotion of El-Montazah Gardens as a smart destination could be also a promotion of other heritage sites in Alexandria via related links. This, in turn, could, gradually, contribute to more effective use of heritage tourism potentials in Alexandria. The Egyptian General of Tourist Guide Syndicate conducting training courses for tour guides about the suggested themes of heritage tours using tools of smart technologies. Future researches can investigate the useful information for various types of heritage tourists in order to be included in the uses of new proposed model. This study could be also an initiative for other studies in order to implement the proposed model in similar heritage destinations either in the city of Alexandria such as Antoniades Garden and AL- Shallalat, or in other similar destinations in Egyptians cities. As a result, this will improve tourist supply in the destination of Alexandria and also in the Egyptian heritage tourism.

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Appendix

City Model Canvas (CMC)

<table>
<tr><td colspan="5">1. Mission statement What is the ultimate goal that the city seeks to achieve?</td></tr>
<tr><td rowspan="2">6. Key Partnerships

Who can help the city deliver the proposed value to the beneficiaries? Who can access key resources that the city council does not have?</td><td>7. Key activities

What must the city council do to create and deliver the proposed value?</td><td rowspan="2">2. Value Proposition

What specific benefits are created and what specific problems does the proposed service solve or alleviate?</td><td>4. Buy-in & support

Whose buy-in is needed in order to deploy the service (legal, policy, procurement, etc.)?</td><td rowspan="2">3. Beneficiaries

Who will directly benefit from the proposed services?</td></tr>
<tr><td>8. Key infrastructure and resources & key regulatory framework

What key resources does the city council have to create and deliver the value? What infrastructure does it need? What is the key regulatory framework required?</td><td>5. Deployment

How will the city solve the problems of the Value proposition specifically?</td></tr>
<tr><td colspan="3">9. Budget cost structure

What costs will the creation and delivery of the proposed services entail?</td><td colspan="2">10. Revenue streams

What sources of revenue for the city do the proposed services provide? What other sources of revenue does the city have?</td></tr>
<tr><td colspan="3">11. Environmental costs

What negative environmental impacts can the proposed services cause?</td><td colspan="2">12. Environmental benefits

What environmental benefits will the proposed services deliver?</td></tr>
<tr><td colspan="3">13. Social risks

What are some of the potential social risks that the proposed service entails? Who is most vulnerable as a result?</td><td colspan="2">14. Social benefits

What social benefits will the proposed services bring about? For whom will these benefits materialize?</td></tr>
</table>