

i-Beacons techniques in the Egyptian Destination: Requirements & advantages

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Abstract:

Many tourism destinations have to use i- Beacons technique to remain competitive and attractive. This technique is a smart marketing tool that facilitates all aspects of tourism, travel and transportation. It can achieve many advantages for tourism organizations, make a direct communication with customers and provide a distinctive customers experience through providing accurate proximity information and personalized offers and suggestions to loyal customers to improve their experience and increase loyalty. The aims of this research are to explore the requirements of applying i-Beacons technique in the Egyptian destination, identify the positive aspect of applying i-Beacons technology, and explore the obstacles to applying such technique. Based on convenience sample, the primary data has been collected using qualitative in-depth interviews with information technology specialists in tourism organizations. The study figured out that the available network at the Egyptian destination is efficient to provide multiple technological services to tourists, and able to accommodate the introduction of new smart techniques such i-Beacons. But, there is a lack of awareness of this technology due to the novelty of its use in Egypt. So, the awareness should be raised through promotion influencing users, whether visual, audio, and print. As well as, conferences, workshops and training for Egyptian employees in information technology and tourism field. These findings have important insights for tourism policymakers as it can enable them to identify the current situation of technological facilities and assist them to emerge i-Beacons technique in the marketing strategies, in order to enhance the customers' satisfaction. The study suggests the improvement of employees' awareness on the importance of using new technologies in their tourism business.

Keywords: Egyptian Destination, Technology infrastructure, i-Beacons awareness, i-Beacons advantages.

1. Introduction:

Smart tourism destinations and tourist experiences have gained particular attention in recent years within tourism and ICTs (Boes et al., 2015). The notion of «e-destination» is still valid. The debate goes beyond the implementation of smart techniques (STs) within destinations towards a «smart destination» that encapsulates a holistic shift of destinations for becoming fully immersed in the current technological change (Buhalis and Amaranggana, 2014). In terms of experiences, major changes can be observed due to the proliferation of ICTs (Buhalis and Amaranggana, 2014).

Experiences have been extended, mediated and enhanced due to ICTs and their influence on the entire tourist trip. This change means that the rapid adoption of certain technologies has shifted from the usual study of the business-centered transformative power of technology, to a more user-centered approach (Jovicic, 2017).

One new technology is i-Beacons technique which was employed during the SAIL Amsterdam 2015 event. Beacons, also referred to as i-Beacons, were first introduced by Apple in 2013 (Shahriar, 2018). This new technology allows tourism

organizations to receive important information from (potential) tourists and send out valuable notifications to them based upon their exact location. The requirements for applying i-Beacons are having the organization' i-Beacons enabled app installed on smartphone and Bluetooth turned on. (Nabben et al., 2016).

Furthermore, Dudhane and Pitambare (2015) contended that the usage of i-Beacons technique can optimize tourist' experiences, improve business processes and generate more revenue. i-Beacons have the ability to engage customers in the right place at the right time while offering utility and value. Therefore, tourism service providers can do the partnerships with each other to rationalize customer experience and loyalty to provide personalized offers and suggestions to loyal customers, empower sales associates and enhance tourist experience through this technique (Dudhane and Pitambare, 2015).

As a result, i-Beacons technology is a smart device that processes wireless signals to work as a guide or a lighthouse to a certain place. In this way it opens new horizons in creating new guiding or marketing applications in addition to using this technique in remote controlling and paying through your mobile phone. This will affect the tourists' experience in the destination. However, there's a lack of research studying the applying of i-Beacons technology in Egypt destination.

The research aims to explore current state of the technological infrastructure in the Egyptian tourist destination, identify requirements for the application of i-Beacons technology in the Egyptian tourist destination, investigate the level of awareness of using i-Beacons technology, whether for users or employees and the methods used to increase awareness, highlight positive aspects of applying i-Beacons technology, and explore the obstacles that may face the application of new technologies in the Egyptian tourist destination.

SAIL Amsterdam is the largest public event in the Netherlands and the largest nautical event in the world offering free public access. Every five years, tall ships from all over the world come to the city to be visited and visitors join activities. This event includes sponsors, visitors, volunteers and inhabitants (D'Atri et al., 2011, and Gong et al., 2020).

The research will try to answer the following questions:

- a. What is the current state of the technological infrastructure in the Egyptian destination?
- b. What are the requirements for applying i-Beacons technology in the Egyptian destination?
- c. What are the advantages of applying i-Beacons technology in the Egyptian destination?
- d. What are the obstacles to applying i-Beacons technology?
- e. What is the level of awareness of i-Beacons technology in the Egyptian destination?

This research contributes to providing policy makers in Egyptian tourist destination, the current situation of technological infrastructure that enables them to design policies & strategies to improve the application of new technologies in tourism field such as i-Beacons.

2. Literature review:

2.1 i-Beacons technique:

i-Beacons technology improves the accuracy of the radio-based indoor stationary localization originally based on Wi-Fi signals. The system of Beacons consists of server(s) and mobile devices with the Android operating system which support Bluetooth Low Energy (Kriz et al., 2016).

i-Beacons technique can be defined as "a small device that connects with other electronic devices and POS (point-of-sale system) in the same physical space, for example a shop; airport; park and museum such may be connected with a system of payment; thus, an individual with a mobile device, for example a smartphone with Bluetooth will receive notifications as long as it is in the range of i-Beacon" (Liberato et al., 2018, p.8).

i-Beacons technology is a small Bluetooth radio transmitter which transmits a unique ID that can be used to detect a position and detect proximity to a point of interest. Furthermore, it can transmit additional information such as specific information about an object, temperature, accelerometer data, URL. In addition, i-Beacons technique enables the implementation of context dependent scenarios, via mobile apps or Bluetooth enabled devices (Venturini et al., 2018).

i-Beacons can only detect the devices in its range. Unless the device owner has downloaded an associated app, i-Beacons technique knows nothing about that individual and cannot pull or capture any information about the device or that person. It has two major components: one is being placed in the venue and the other one is the app installed on the customer's smartphone (Dudhane and Pitambare, 2015).

2.2 Advantages of i-Beacons technique:

Indoor positioning has become a challenge, because Global Positioning Systems (GPS) do not work properly inside the buildings. For this reason Bluetooth Low Energy (BLE) is preferable for indoor positioning. i-Beacon technology is a new smart technique, which allows smartphones, tablets and other devices to perform actions when in close proximity. Products and devices equipped with i-Beacons technology can interact with nearby devices by emitting passive signals; this technology, which reaches the customers depending on the distance, can transmit the desired information to the customers who have interacted (Rajoriya and Singh, 2020).

Also, Uttarwar and Chong (2017) added that Global Positioning Systems (GPS) receivers are used for outdoor navigation, which are the part of recent smartphones and tablet devices. However, GPS are not suitable for indoor navigations because of their signal limitations which are blocked by ceiling and walls. Indoor navigation can be achieved through a mobile phone using a recent technology that utilizes Bluetooth, namely i-Beacons. i-Beacons devices are small transmitters,

running on Bluetooth Low Energy (BLE) technology and used as a point of reference for mobile devices. They can detect a Bluetooth enabled device once it enters its transmission range.

i-Beacons devices are considered one of the most popular technologies implemented in indoor navigation. It has multiple strengths which allow tourism organization to connect positively with their tourists (Sasaki et al., 2020).

Based on Jeon et al. (2018) the strengths of i-Beacons are; easy to install, as most don't need connectivity, provide accurate proximity information, even indoors, Beacons hardware is inexpensive (cheap to implement, cheap to develop and cheap to demo), running on batteries for several months to several years, depending on the configuration, very small and discreet.

More specifically, i-Beacons technology acts as a radio transmitter that has a range of 50 to 100 meters indoor. One of the advantages of i-Beacons is being economical (from 200 to 2000 can be installed with minimal effort, determine an exact position up to one meter and are supported by many operating systems and devices). It is also very energy efficient (Singh et al., 2015). In addition, it's suitable for indoor navigations (Uttarwar and Chong, 2017). See figure (1).

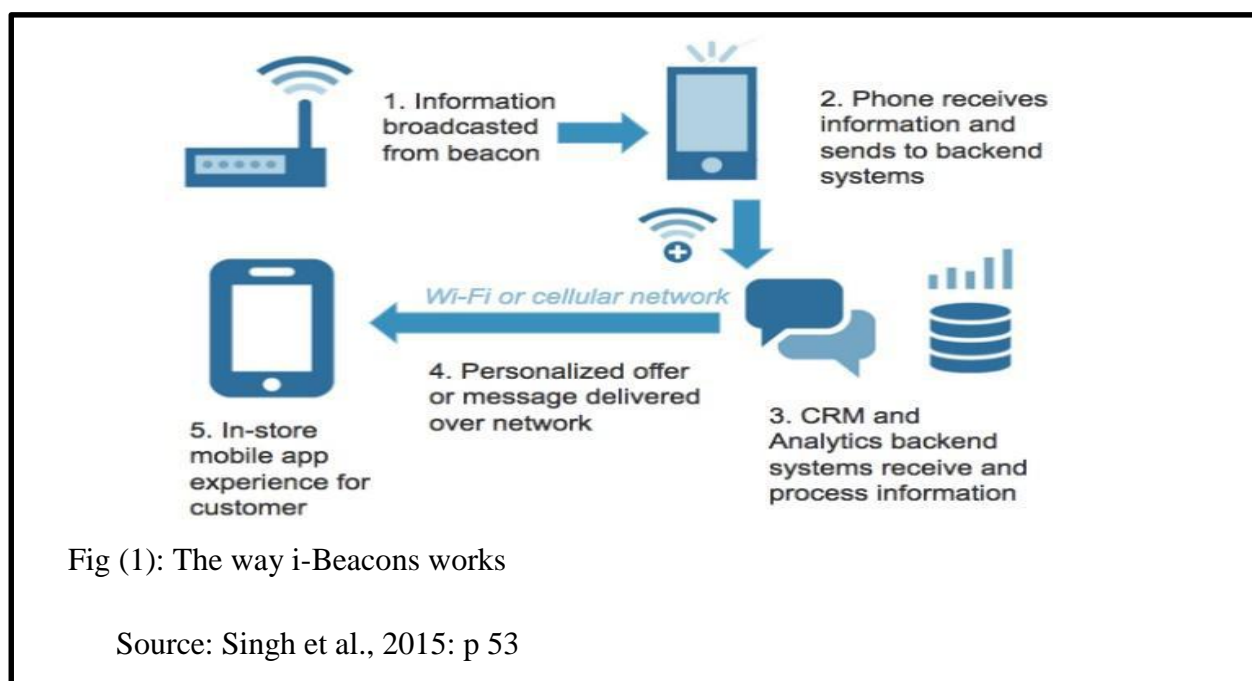


Fig (1): The way i-Beacons works

Source: Singh et al., 2015: p 53

In addition, Toledo et al. (2018) assured that i-Beacons technology is also commonly used for advertising and marketing purposes. In that case, notifications with advertising messages are sent to customers near i-Beacon' area in order to provide users with information about offers or specific products depending on their location.

Also, i-Beacons technology is considered one of mobile ticketing solutions and offers a number of benefits, including enhancing flexibility, micro-location of passengers, good travelling experience and suitability to complex intermodal transport networks (Ferreira et al., 2020). Hiramatsu et al. (2016) assured that Beacons

technique not only provides a guide for a specific location but also explains the traditional customs and history of the area.

i-Beacons can help tourists check the online prices or obtain product information; providing customers with the information they seem to need at specific locations during their holiday and thus improving the overall tourist experience (Thamm et al., 2016). Furthermore, i-Beacons technology has the advantage of more accurate positioning than GPS. Tourism organizations provide their product information for users through the basic function of a Beacon, using an O2O (Online to Offline) marketing solution and, therefore, effectively enable tourists to make relevant payments online and conduct their financial actions offline (Kwon et al., 2014).

For example, Edinburgh guides its tourists through the Royal Mile on smartphone without the internet connection through i-Beacons technique. i-Beacons deployed along the Royal Mile trigger information and stories about streets, buildings and museums that a user passes by. All the pieces of content may be read or listened to, accessed with or without the Internet connection, and consumed immediately or saved for later (Dragović et al., 2018).

2.3 Requirements of i-Beacons technique:

i-Beacons are devices made by Estimote, Kontakt, Gimbal, and other manufacturers. It may be adopted by shop marketers; a visitor with a BLE (Bluetooth low energy) enabled Smartphone may be notified of special offers, discounts, information, and so forth based on his/her position or proximity to a Beacon. It finds similar use in museums and exhibition halls (Kriz et al., 2016).

i-Beacons' requirements include a chip and other electronic components on a small circuit board. A Beacon is fundamentally a radio transmitter that sends out a one-way signal to smartphones. i-Beacons appear in difference sizes but are generally small and inexpensive. Prices vary but they can be purchased for less than \$30. It is as small as a quarter and usually fit in the palm of a hand (Sterling et al., 2014).

i-Beacons technique requirements can be summarized as follows:

- **i-Beacons devices transmit Bluetooth signals:-** Devices with i-Beacon technology use a one-way discovery mechanism and transmit small data packets in pre-specified intervals.
- **Mobile device (smart phone with i-Beacons app detects the signals):-** i-Beacons application must be installed on the smartphone or tablet (the receiving user device) to interact with the incoming beacons.
- **App reacts and shows the relevant content:** - A user smartphone receiving an i-Beacon packet can approximate the distance of the source of the packet and may perform actions, in close proximity of it (Dalkılıç et al., 2017).

3. Methodology

3.1 Procedures and measurement

Due to the modernity of this research area, this is an exploratory study, permitting the identification of main topics. It, also, enhances understanding and highlights topics that need further research (Bale et al., 2016). The current research adopts the qualitative method that enables researchers to get deeper understanding of

the individual's views. It also allows informants to describe their experiences and introduce concepts of importance from their perspective and in their own words, rather than adhering to a framework that has been imposed by the researcher (Altinay and Paraskevas, 2008). This study used in-depth interviews as data collection instrument. This interview is used to extract more detailed information or deep understanding of the research subject (Guion et al., 2011).

Based on convenient sample, the field study was conducted with (12) in-depth interviews with representative of key organizations that concerned with information technology in tourism field (Ministry of Communications, National Communications Regulation Authority, Sandyford Hotel, Ireland, Center for Documentation of Cultural and Natural Heritage, Travco Travel and Tourism Company, Ministry of Tourism, Tourism Promotion Authority, Cairo Airport, The Egyptian museum, Safir travel and tourism company, and Hilton hotel- Egypt. Fourteen potential interviewees were contacted, out of which (12) were actually conducted. The selected interviewees were considered specialists and experts and the most knowledgeable persons in the field of information technology and tourism to provide us with suitable information that necessary to develop an understanding of problem and provide recommendations to encourage the adoption of this smart technology in the Egyptian destination.

The interview guide consisted of (5) open ended questions. The first two questions collected data about the current situation of technological infrastructure in Egyptian destination and the requirements for applying i-Beacons. The third question dealt with the respondents' opinion for the advantages of applying i-Beacons in the Egyptian destination. The fourth question asked respondents about the obstacles to applying i-Beacons technology. The last question asked respondents about the level of awareness of i-Beacons technology in the Egyptian destination. Simple analysis of interviewees' responses was conducted to ensure that the objectives of the study were achieved.

Interviews were conducted from February 15th to March 30th. The average time for each interview was about an hour and a half (1), these interviews are organized via Telephone, online (via zoom meeting) or in person.

Respondent No	Title	Place	Method
R1	Information Technology (IT) Administrator	Ministry of Communications	In person
R2	Information Technology (IT) Director	National Communications Regulation Authority	In person
R3	Information Technology (IT) Director	Sandyford Hotel, Ireland	Online- via zoom
R4	Information Technology (IT) Engineer	Center for Documentation of Cultural and Natural Heritage	In person
R5	Information Technology (IT) Director	Travco Travel and Tourism Company	Online- via zoom
R6	Information Technology (IT) administrator	Ministry of Tourism	In person
R7	Information Technology (IT) Unit Director	Tourism Promotion Authority	In person
R8	Chairman	Memphis Tours Egypt	Online – via zoom
R9	Network Manager	Cairo Airport	In person
R10	Information technology (IT) specialist	The Egyptian museum	Telephone call
R11	Information Technology (IT) Director	Safir travel and tourism company	In person
R12	Information technology (IT) specialist	Hilton Hotel- Egypt	Telephone call

4. Results:

With regard to the current state of the technological infrastructure in the Egyptian tourist destination and via personal interviews, it has been concluded that the available network is efficient to provide multiple services to tourists. Also, the technological infrastructure in Egyptian airports allows indirect support for the frequent traveler through the baggage service. In addition, the wireless services are of sufficient quality and efficiency and have facilitated many aspects of travel for the traveler.

Regarding the extent to which the technological infrastructure is absorbed in the Egyptian tourist destination to receive new technology such as i-Beacons, respondents (1, 12) emphasized that the Egyptian telecommunications and information technology sector works as a transversal sector to enable all sectors of the state to achieve digital transformation through the implementation of a large number of projects in cooperation with all state agencies and institutions. The most prominent of these is the implementation of the Egyptian information infrastructure Project, which links more than 70 databases in order to provide a platform that ensures the organization and exchange of information among state agencies in order to provide integrated services to citizens.

Respondents (2, 4, and 11) agreed that the Ministry of Communications had developed an integrated vision to support and enhance all the factors that underpin the

communications and information technology industry, in order to ensure its supremacy, success and leadership. This vision includes building the capabilities of companies operating in the sector and providing access to global markets, as well as developing human resources. Qualifying youth to work in the sector, as well as attracting foreign direct investment, and developing e-commerce are attained, too.

Respondent (3, 10) added that Egypt had competitive capabilities and advantages making it an ideal partner for foreign institutions and companies to invest in the communications and information technology sector in Africa and the Middle East.

On the other hand, respondent (5) clarified that the communications and information technology sector in the Egyptian tourist destination seeks continuous technological development and the application of new technologies to improve the service, especially in Egyptian airports, as it is one of the first tourism establishments that leave an impression on the morale of the customer, whether positively or negatively.

Respondents (6, 7, 8, and 9) were similar in opinion and emphasized that the technological environment in Egypt accommodated the introduction of new technology, especially after Covid-19. It has proven its efficiency. For example, there are state's trends towards the introduction of information technology in daily dealings and the best examples of that include the following:

- a) The smart technological capital
- b) Automation of civil status
- c) Automation of traffic services
- d) Internet banking services in banks

The requirements for the application of i-Beacons technology in the Egyptian destination are classified into three categories: a) marketing campaigns for users and employees, b) technological facilities and c) human resources.

The marketing requirements to implement i-Beacons technology are as follows:

- a) Introducing the tourist to i-Beacons technology through advertisements, whether paper or electronic
- b) Availability of applications associated with the i-Beacons technology device through smart phones (play store)
- c) The i-Beacons technology being advertised both inside and outside Egypt through exhibitions and conferences
- d) Raising awareness of tourism stakeholders about the importance of smart technologies and their role in facilitating service provision
- e) Advertising through the international outlets of the country that have a direct relationship with tourists
- f) Choosing the marketing method most used and effective in the country which enables the technology to be spread quickly, whether visual, read or audible.

The technological requirements needed to implement i-Beacon technology in the Egyptian tourist destination are as follows:

- a) Encouraging investing in information technology
- b) Discarding paper-based bureaucracy and switching to smart services, for example the one-window service

- c) Making i-Beacons technology devices available
- d) Availability of an adequate number of i-Beacons technology devices at the airport, for good coverage and good connectivity
- e) Meanwhile, the fourth and eleventh respondents emphasized the need to ensure the compatibility of the wireless network used in the Egyptian tourist destination with this device.
- f) Ensuring that the tourist's global system for mobile "GSM" is compatible with the system prevailing in the Egyptian tourist destination.
- g) Adequate coverage of the Internet within the Egyptian tourist destination 4G.

Also, the interviewees confirmed that one of the most important human requirements needed to implement i-Beacons technology in the Egyptian tourist destination is good marketing and good awareness of the device, in addition to holding training courses for tourism business owners through the chambers of commerce.

The sixth and twelfth respondents added that an item must be placed in the state's annual budget for education, training, and the promotion of the human factor. The seventh respondent added the need to consolidate relations between countries and companies and to spread information and modern technologies between them. On the other hand, the eighth and tenth respondents emphasized the importance of holding training courses for workers in the field of information technology and workers in the tourism field through specialists who had previously dealt with this device to overcome the crisis of acceptance and deal with new technology. This is in addition to the importance of joint cooperation between governments and the transfer of modern technologies used by foreign countries; cross experience - cross contact.

Concerning awareness of use, whether for users or IT professionals and the methods used to increase this awareness,

Respondents assured that foreign users are very familiar with the use of information technology and modern ones. As for information technology specialists, they are at the highest level of competence to deal with modern technology. Awareness of the use can be increased through conferences, workshops and training, whether from Chamber of Tourism Companies or the Ministry of Tourism and the Tourism Promotion Authority.

Also, respondents (1, 2- 3-10) added that the lack of their awareness of this technology is due to the novelty of its use in Egypt. So, the awareness should be raised through promotion influencing users, whether visual, audio, or print through the following tools:

- a) Flyers
- b) Mobile messages through mobile network service providers.

Advantages of applying i-Beacon technology

The first and the tenth respondents confirmed that i-Beacons technology is used on the private and public levels. It also enables the customer to interact directly with the provided tourism services. The second added that i-Beacons technology helps attract

attention to unknown places and facilitates the visit by domestic and international tourists. The third respondent also showed that i-Beacons technology helps cover any shortage of information and rare languages.

The fourth, sixth and twelfth respondents indicated that i-Beacons technology contributes to creating new job opportunities in the field of information technology, and will not affect employment directly because it will be available. At the same time, labor will be available, which will give the tourist the ability to easily choose what he/she prefers.

The fifth, eighth and eleventh respondents assured that one of the most important advantages of i-Beacon technology is that it gives tourism businesses the opportunity to provide the services and information needed by tourists in various languages. This leads to easy access to service and improvement of the tourism experience. The seventh has explained that this technology supports the tour guide in many languages and supports humans who can easily forget.

Negative aspects of the application of i-Beacons technology

The researcher has noticed, through personal interviews, the similarity of opinions regarding the negatives of i-Beacons technology. Interviewees agreed that the frequencies of the technology may conflict or interfere in the wireless signals among them and other systems because wireless systems can affect the wireless connection.

The fifth respondent also assumed that i-Beacons technology could reduce human interaction, which is required in providing the service.

The eighth and twelfth respondent added that it must be studied whether the frequencies of i-Beacons technology could negatively affect the archaeological areas or not.

With regard to the organizational culture in the Egyptian tourism organizations and their potential for change and application of modern technology, the first and eleventh respondents have emphasized that the organizational culture should be developed and changed to be able to provide adequate facilities for tourists. The second adds that it is necessary to search for modern and smart technology and apply it in tourism organizations in order to reduce the time consumed for dealing with tourists so that they spend their time only enjoying the service.

The third, sixth, tenth and twelfth respondents have agreed that the organizational culture in the tourism organizations is ready to use every modern technology. In addition, they enjoy the constant aspiration to increase the attraction of attention to increase the indirect income and number of visitors through modern technology, which will be beneficial to the general income of the destination.

Respondents four, five, seven and eight have agreed that the organizational culture is flexible to the extent that it permits the application of all that is modern, but after study, examination and approvals.

With regard to the culture of management in every newly-applied technology, the first, fourth and tenth respondents have indicated that the management is constantly monitoring technological development and studies the extent to which it fits with the

company's needs in order to facilitate communication between the company and the customer.

The second and twelfth respondents show that the level of technological culture is still different, as there are some companies and hotels that use the highest technological levels, while many companies and hotels are still completely far from technological use.

The third, fifth and eleventh respondents have clarified that the state is seeking digital transformation, and the Corona crisis has helped and supported this transformation.

The sixth, seventh and eighth respondents agree that one of the most important advantages of digital transformation is financial inclusion (visa), e-learning and distance education, which in turn contributes to spreading technological culture and supports modern technology and its application.

With regard to the barriers to the application of latest technologies, such as i-Beacons technology, all of the interviewees stated that one of the most important obstacles to the application of modern technology was the lack of cultural awareness of its importance and services. Therefore, the awareness of the importance of such technology should be increased at the level of tourists and employees, and this is to be done through good marketing, publicity and advertising. Lack of free internet coverage hindered the application and provision of modern technological services, too.

With regard to the period of time required to overcome the obstacles to the application of i-Beacons technology, the researcher concluded, via personal interviews and convergence of opinions among respondents, if the state adopts the provision of free internet and seminars; adopting the policy of scientific conferences and seminars, the period will not exceed three years. i-Beacons technology will become one of the first techniques that will be applied widely.

The application of i-Beacons technology requires training and time for training depends on the extent of their ability to absorb modern technology through the exchange of knowledge among employees of the Egyptian tourism organizations, whether internal or external, through the circulation of information; for example the training period needs approximately six months.

5. Conclusion and recommendations:

This research aims to shed light on the current situation of i-Beacons technology implementation in Egyptian tourism destination. The research attempts to understand the perspective of key organizations towards applying i-Beacons technique. The literature review highlighted the definition of i-Beacons technique, its advantages and the requirements of applying it.

The practical study has been conducted to achieve the research aim and clarify the requirements of applying i-Beacons technique in the Egyptian tourist destination, as one of the new smartness technique. In addition to the importance of this new technology and the key obstacles facing the implementation of i-Beacons technique and finally provide suggestions that encourage i-Beacons implementation in the Egyptian destination.

The study findings revealed that the current situation of technological infrastructure in the Egyptian destination is able to provide multiple services to tourists. For example, the technological infrastructure in the Egyptian airports allows indirect support for frequent traveler through the baggage service. As well as, the wireless services are effective and have facilitated all travel aspects. In addition, the technological environment in Egypt is able to accommodate the introduction of smart techniques, specially, after Covid- 19; it has proven its efficiency.

The requirements of applying i-Beacons can be classified in three stages:

- a) Marketing stage is to introducing the tourist to i-Beacons technology through the advertisements and both locals and international conferences.
- b) The second stage is to ensuring the availability of technological facilities. The following requirements are essential; availability of an adequate number of i-Beacons technology devices, adequate coverage of the internet 4G and ensuring that the tourists' global system for mobile "GSM" is compatible with the applied system in the Egyptian destination. Moreover, ensuring the compatibility of the wireless network used in the Egyptian destination with this device. This finding comes to agree with (ACI/ IATA, 2016), which confirmed that i-Beacons technology need various infrastructures such as i-Beacons devices, Wi-Fi networks, 3G/ 4G networks and other information sources where available.
- c) The third stage concerned with human resources requirement needed to implement i- Beacons technology in the Egyptian destination. The majority of the interviewees emphasize the importance of holding training courses for tourism business owners and tourism employees. Besides, raising the awareness of this device.

The study findings also confirmed that i- Beacons enables the customer to interact directly with the provided tourism services, helps attract attention to unknown places and facilitates the visit by domestics and international tourists, helps cover any shortage of information and rare languages, contributes to creating new job opportunities in the field of information technology, gives tourism businesses the opportunity to provide the services and information needed by tourists in various languages, supports the tour guide in many languages and supports humans who can easily forget and leads to easy access to service and improvement of the tourism experience. The previous advantages come in line with Singh et al. (2015), Toledo et al. (2018), and Ferreira et al. (2020). who confirmed that i- Beacons is considered one of smart marketing techniques offers a number of benefits including enhancing flexibility, good tourist experience, and suitability to complex intermodal transport networks, as well, giving tourist more details about the destination and gives him the opportunity to discover new destinations.

The majority of interviewees assured that the most important obstacles to applying i-Beacons is the lack of their awareness of this technology due to the novelty of its use in Egypt. So, the awareness should be raised through promotion affecting users, whether visual, audio, and print. As well as, conferences, workshops and training for Egyptian employees in information technology and tourism field.

The study will be beneficial to tourism industry through raising the policy makers' awareness on i-Beacons technology, and identifying the needed facilities to use such technique in the Egyptian tourist destination.

The research recommends governments to adopt information and communication technology to build "smart" and more sustainable cities for their citizens and visitors, in a way that contributes to improving the standard of living, efficiency of services and enhances sustainable development. As well as, motivate governments to develop the technological infrastructure to be able to accommodate smart technologies and provide advanced marketing services.

Destination' policy makers should motivate tourism organizations to apply the smart techniques in their business through rewarding smart bodies.

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تقنيات المرشد اللاسلكي في المقصد السياحي المصري: المتطلبات والمزايا

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الملخص العربي:

أصبح من الضروري للعديد من الوجهات السياحية استخدام تقنية المرشد اللاسلكي لتبقى قادرة على المنافسة وجذابة. هذه التقنية هي أداة تسويقية ذكية تسهل جميع جوانب السياحة والسفر. كما يمكن أن تحقق العديد من المزايا للمنظمات السياحية، وإجراء اتصال مباشر مع السائحين وتقديم تجربة مميزة لهم من خلال توفير معلومات دقيقة وعروض واقتراحات شخصية لتحسين تجربتهم وزيادة ولائهم. تتمثل أهداف هذا البحث في استكشاف متطلبات تطبيق تقنية المرشد اللاسلكي في الوجهة المصرية، وتحديد الجانب الإيجابي لتطبيقها، واستكشاف العوائق التي تحول دون تطبيق هذه التقنية. بناءً على العينة الملائمة، تم جمع البيانات الأولية باستخدام المقابلات النوعية المتعمقة مع متخصصي تكنولوجيا المعلومات في المنظمات السياحية. توصلت الدراسة إلى أن الشبكة المتاحة في الوجهة المصرية تتسم بالكفاءة في تقديم خدمات تكنولوجية متعددة للسياح، وقادرة على استيعاب إدخال تقنيات ذكية جديدة مثل المرشد اللاسلكي لكن هناك نقص في الوعي بهذه التكنولوجيا بسبب حداثة استخدامها في مصر. لذلك يجب رفع مستوى الوعي من خلال الترويج المؤثر على المستخدمين، سواء المرئي، المسموع أو المكتوب. بالإضافة إلى المؤتمرات وورش العمل والتدريب للموظفين المصريين في مجال تكنولوجيا المعلومات والسياحة. تقدم هذه النتائج رؤى مهمة لوضعي السياسات السياحية لأنها تمكنهم من تحديد الوضع الحالي للبنية التحتية التكنولوجية ومساعدتهم على دمج تقنية المرشد اللاسلكي في استراتيجيات التسويق، من أجل تعزيز رضا العملاء. كما تقترح الدراسة تحسين وعي الموظفين بأهمية استخدام التقنيات الذكية في أعمالهم السياحية.