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IO1- A3: Digital Design Compendium **Module: The value of digitization in travelling:** **How tourism can survive the crisis**

KA2 - Cooperation for innovation and the exchange of good practices
Partnerships for creativity



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REFERENCED DOCUMENTS

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1	2020-1-UK01-KA227-YOU-094543		HerTour4Youth Proposal
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1. Introduction

This module will explore the importance of the ICT (information and communication technologies) in the tourism and how the explosive growth in technology has made a significant impact on every aspect of the tourism industry. Also will look at the engagement between heritage tourism and ICT and how this ones represents an opportunity to preserve culture, create partnership and enhance destinations value in information society.

1.2 Learning Outcomes

After completing this module, you will be able to:

- To identify the role of ICT in tourism industry
- To spot actions that safeguard heritage tourism
- To conceptualize new ICT solutions

1.3 Key words

Emerging ICT, Digital tourism, Heritage tourism, Smart tourism, E-Tourism.

1.4 Estimated seat time

1 hour

1.5 Glossary of terms

Augmented Reality: (AR) Augmented reality (AR) is a type of interactive, reality-based display environment that takes the capabilities of computer generated display, sound, text and effects to enhance the user's real-world experience.

Augmented reality combines real and computer-based scenes and images to deliver a unified but enhanced view of the world.

Big Data: Big data refers to a process that is used when traditional data mining and handling techniques cannot uncover the insights and meaning of the underlying data. Data that is unstructured or time sensitive or simply very large cannot be processed by relational database engines. This type of data requires a different processing approach called big data, which uses massive parallelism on readily-available hardware.

Blockchain: is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system. A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain.

Cognitive Computing (CC) refers to technology platforms that, broadly speaking, are based on the scientific disciplines of artificial intelligence and signal processing. These platforms encompass machine learning, reasoning, natural language processing, speech recognition and vision (object recognition), human-computer interaction, dialog and narrative generation, among other technologies.

Digitization is the process of converting analog signals or information of any form into a digital format that can be understood by computer systems or electronic devices. The term is used when converting information, like text, images or voices and sounds, into binary code. Digitized information is easier to store, access and transmit, and digitization is used by a number of consumer electronic devices.

Geographic information system (GIS) is a system designed to capture, analyze, store, manipulate, present and manage all types of geographical data, like information from maps, global positioning systems (GPS) and ubiquitous data, like locations of landmarks and areas hit by calamities. It can display data related to positions on the Earth's surface and show these different types of data on a map, allowing people to see various data patterns and relationships.

ICT: Information and communications technology is an extensional term for information technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, middleware, storage and audiovisual, that enable users to access, store, transmit, understand and manipulate information.

Internet of Things (IoT): The Internet of Things (IoT) is a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices and send and receive data.

Small data: Small data describes data use that relies on targeted data acquisition and data mining. It describes a shift in how businesses and other parties look at data use, and is intended to be a counterpoint to the trend toward big data, which revolves around the idea that businesses can use massive amounts of acquired data to pinpoint customer behavior or drive business intelligence in key ways.

Smart tourism: A destination facilitating access to tourism and hospitality products, services, spaces, and experiences through ICT-based tools. It is a healthy social and cultural environment, which can be found through a focus on the city's social and human capital. It also implements innovative, intelligent solutions and fosters the development of entrepreneurial businesses and their interconnectedness.

Virtual reality (VR) refers to computer-generated environments or realities that are designed to simulate a person's physical presence in a specific environment that is designed to feel real. The purpose of VR is to allow a person to experience and manipulate the environment as if it were the real world. The best virtual realities are able to immerse the user completely. Virtual reality should not be confused with simple 3-D environments like those found in computer games, where you get to experience and manipulate the environment through an avatar, rather than personally becoming part of the virtual world.

Voice over Internet Protocol (VoIP) is a technology used for delivering different kinds of data from a source to a destination using IP (Internet Protocol). The data may be in many forms, including files, voice communication, pictures, fax or multimedia messages. VoIP is most often used for telephone calls, which are almost free of charge.

Wearable device: A wearable device is a technology that is worn on the human body. This type of device has become a more common part of the tech world as companies have started to evolve more types of devices that are small enough to wear and that include powerful sensor technologies that can collect and deliver information about their surroundings.

Wearable devices are also known as wearable gadgets, wearable technology or simply wearables.

2. The value of digitization in travelling: How tourism can survive the crisis

2.1 Introduction

At the beginning of 2020, borders were closed globally and millions of people were ordered to stay at home. It was then, when the tourism industry also began to experience a crisis worldwide. Few industries have suffered more due to the global pandemic generated by COVID-19. International and national travel have suffered from the crisis. The impact on the tourism industry has been enormous. Millions of businesses dedicated to tourism have been closed for long periods and this has resulted in long periods of labor inactivity for people who are dedicated to tourism.

However, we have seen how information and communication technologies (from now on ICT) have played a fundamental role in the tourism industry. We saw how museums created exhibitions and virtual tours, how improvised concerts were created on social networks, etc. In this way, we have witnessed a very rapid phenomenon of ICT integration in the tourism industry, and we have seen how the integration of ICT in the tourism industry is essential. ICTs make it easier for an individual to access information on tourism products from anywhere and at any time.

2.2 The revolution of digitalization in tourism industry

Since the late 1990s, the Internet has empowered the distribution of multimedia applications, such as text data, videos, images, sounds, etc.

In 1993 the first internet search engine was developed, however it was with the development first of Yahoo and a bit later Google, which provided an unprecedented ability to find anything, including information on destinations and services¹.

The tourism sector in this sense is the perfect example of how the digitization of people has been capable of transforming an entire industry. A few years ago, people went to travel agencies, where they recommended standard pre-packaged packages for everyone. Nowadays, the tourist is a more informed and demanding consumer with the ability to buy plane tickets or tickets for any event, for example, with just one click on the Internet. Today, mediators are no longer needed in the tourism sector.

Related to what we said above, we are going to break down how the development of technologies has transformed the tourism industry:

1) Technology helps to have more personalized travel experiences

As we already mentioned before, technology provides us with applications and tools to find the best services that are available in order to have a trip based in our preferences and needs. For

¹ Search engine. (n.d.). Wikipedia. Retrieved 2022, from https://en.wikipedia.org/wiki/Search_engine



example: we can find flights and choose the time for the departure and arrival, we can book accommodation in 5 minutes and tickets to enter a museum to avoid the queues.

Source:<https://www.freepik.es/vectores/viajes>

2) Universal accessibility. The digitization in destinations called 'smart destinations' have opened much more accessibility for people with disabilities or mobility problems to live much more satisfying and fulfilling experiences while traveling.

3) Comfort, speed and immediate availability of information. People's need to travel faster, safer and more efficiently has driven the invention of great technological solutions. Instant access to all kinds of information such as tips for travelers, weather, restaurants, art galleries, museums and much more, makes technology an essential tool.



Source: <https://pixabay.com/images/id-1875813/>

4) More flexible prices. As we have seen above, today, people are continuously connected to technological tools through our mobile phones, computers or tablets. With the digitization of people, travel agencies have lost importance and in 5 minutes it is possible to buy a plane ticket with personalized options of what day to travel and what time, and also before buying any service it is possible to compare prices on different dates . This means that intermediaries are not necessary and prices are more flexible with the competition of services.

5) Social networks play an important role within the travel industry. On the one hand, tourists use these platforms to share content related to our trips online. On the other hand, companies and organizations that are dedicated to tourism and tour guides use social networks as a marketing tool, offering their services and products. When it came to social media profiles, National Geographic Travel @natgeotravel was the most-followed travel influencer on Instagram worldwide as of December 2021, with a

following of 44.8 million Instagram users.

6) 24/7 assistance. Digital technology has completely changed the way people used to connect with service providers. Now, with the help of digital technology it is possible to have a 24/7 assistance. It is possible to have assistance thanks to chatbots on social network (mainly Facebook and Twitter).

2.2.1. ICT tools and innovation in tourism industry

ICT is a broad terminology referring to multiple communication technologies which range from simple and complex namely Cell Phone applications (SMS), Digital Cameras, Internet, Wireless (WiFi and WiMAN), VOiP, GPS, GIS, Convergence (data, voice, media), Digital radio, etc.

These technologies are creating a new global market place, which is more competitive e-Tourism is expected to benefit economic development in several ways²:

- 1. Through allowing Heritage Information access to global markets,*
- 2. By providing new opportunities to export a wider range of services,*

² Zhang, J., & Lin, Y. (2018). *Can Foreign Remittances Accelerate Economic Growth? An Empirical Analysis for China*. <https://www.iiste.org/>. Retrieved 2021, from <https://www.iiste.org/Journals/index.php/JEDS/article/view/42443/43710>

3. *By improving the efficiency of web sites and communications facilities.*

The ICT driven re-engineering has gradually generated a new paradigm-shift, altering the industry structure and developing a whole range of opportunities and threats. ICTs have been transforming tourism globally:

- ICTs empower consumers to identify, customize and purchase tourism products and support the globalization of the industry by providing tools for developing, managing and distributing offerings worldwide³.
- ICTs have come to play a fundamental role in organizations, tourist destinations and also in tourists. In recent years, we have witnessed a technological development that has boosted competitiveness in organizations. We have seen this technological development in the increase in devices, the decrease in their cost, and improvements in ICT capabilities.
- ICTs provide a powerful tool that can bring advantages in promoting and strengthening the strategy and operations of the tourism industry., providing a powerful tool that can bring advantages in promoting and strengthening the tourism industry's strategy and operations⁴.

³ Buhalis, D., & Law, R. (2008, August 1). *Progress in Information Technology and Tourism Management: 20 Years on and 10 Years After the Internet—The. . .*

ResearchGate.

https://www.researchgate.net/publication/222696021_Progress_in_Information_Technology_and_Tourism_Management_20_Years_on_and_10_Years_After_the_Internet-The_State_of_eTourism_Research

⁴ Bethapudi, A. (2013). THE ROLE OF ICT IN TOURISM INDUSTRY. *Journal of Applied Economics and Business.*

<http://www.aebjournal.org/articles/0104/010406.pdf>



Source: <https://pixabay.com/images/id-4168483/>

2.3. Safeguarding heritage tourism


With COVID-19 bringing global tourism to a standstill, millions of people in quarantine have been seeking out cultural and travel experiences from their homes. Culture has proven indispensable during this period and since the very start of the pandemic, the wider world of culture and heritage tourism sector has mobilized swiftly and in many different ways to understand and mitigate the effects of the crisis⁵.

During the pandemic there have been different initiatives in the heritage tourism: virtual access to museums, heritage sites, theaters and performances. If you are an aqua sightseer, you might be aware of a documentary exploring the Great Barrier Reef.


Through an interactive website, one can view the clear, tranquil currents of the Pacific Ocean and the biodiversity of the reef, and experience the

⁵ *Cultural tourism & COVID19* / UNWTO. (n.d.). UNWTO. Retrieved November 25, 2021, from <https://www.unwto.org/cultural-tourism-covid-19>

sounds of a healthy coral reef.

 Click here to experience the Great barrier reef:
<https://attenboroughsreef.com/>

During the pandemic, the Official Tourist Board of the Faroe Islands also crafted a virtual experience to entice post-pandemic visitors from across the world.

 Click here to see what they did in the faroe islands during the pandemic: <https://www.visitfaroeislands.com/see-do/visit-faroe-islands-from-home/>

As a result of the pandemic, numerous investigations and new technological approaches have been published to safeguard heritage tourism.

According to World Tourism Organisation⁶ If tourism aspires to contribute to the survival of the cultural sector, i.e. cinemas, arts and many other segments, it should reinforce the cultural identity and branding of tourist destinations.

Despite all the challenges, tourism and culture now have the opportunity to create new alliances and collaborations, reinvent themselves together, diversify the offer, reach other audiences, develop new capacities and support the global transition to the new conditions.

2.3.1. Actions that safeguard heritage tourism

Different organisation have made recommendations in order to safeguard the heritage tourism. Among the actions we can find the following suggestions:

⁶ *Turismo cultural y COVID19 | OMT*. (n.d.). UNWTO. Retrieved November 30, 2021, from <https://www.unwto.org/es/turismo-cultural-covid-19>

➤ **Shift from quantity towards quality⁴**

Tourism success was traditionally measured by statistics highlighting visitors' numbers, while qualitative indicators and visitors' profile had less importance. The joint recovery of tourism and culture should align resilience policies, new priorities with the new measurement values, as well as tailor-made marketing strategies.

➤ **Diversify cultural tourism products⁵**

Destinations should address new and traditional markets & specific profiles of cultural visitors, whose interests and priorities may reshape after COVID-19 crisis. Culture will require support to survive and flourish, as it enriches the destinations' identity and inspires tourism revival. Some cultural gatherings may be temporarily replaced by alternative products, as new scenarios unfold.

➤ **Customize cultural offer for international visitors⁵**

Bringing back inbound cultural tourism will be more challenging before consumers decide to travel abroad. By customizing their cultural offer, governments, destinations and cultural industries can have a more international outreach. International and cross-sectoral alliances will have a key role.

➤ **Support job-seekers to gain with new skills, new products, marketing, market intelligence**

From platforms that they support to gain skills in specific topics, for example: Coursera.org for trainings or courses, Canva.com to design logos, visit cards, posters, banners, etc, Social media platforms like Instagram or Facebook for marketing, etc.

➤ **Make cultural tourism accessible to all⁵**

The accessibility of cultural facilities, products and services should be advanced to cater better to the needs of persons with disabilities, seniors

and families with small children, locals & visitors alike. Scaling up accessibility in culture benefits everyone.

➤ **Smart tourist destinations⁷.**

The Smart tourism responds to new challenges and demands in a fast-changing sector, including the evolution of digital tools, products and services; equal opportunity and access for all visitors; sustainable development of the local area; and support to creative industries, local talent and heritage.

➤ **Boost innovation⁶**

Harnessing innovation and digital advances provides tourism with opportunities to improve inclusiveness, local community empowerment and efficient resource management.

➤ **Provide more and better training and implement online training⁶**

to skill up staff in service delivery, back office, technology, languages, safety measures.

2.4. New ICT solutions

We have seen how the Internet has dramatically changed the way in which consumers plan and buy their holidays and other tourism products, and also how tourist organizations, companies and tour guides promote and sell their products and services.

⁷ Segittur. (2020, July). *Guía para la reactivación de Destinos Turísticos Inteligentes en el contexto del COVID19*. <https://www.segittur.es/wp-content/uploads/2020/07/guia-reactivacion-dtis-covid.pdf>

Since the pandemic we have seen how the tourism has adapted to the current situation thanks to the ICT and the e-marketing.

Tourist destinations and their teams must have a broad knowledge of technologies that can improve the traveller's experience⁸.

Therefore, they must apply the technologies, tools, methodologies and techniques that best adapt to the needs of tourists depending on their stage of the journey.

We bring you here, technological examples that tourism industry has been adapting to the specific needs:

- The use of **QR Codes** has increased as a consequence of the pandemic. For example, restaurants use the QR code as a digital menu, or in some cities they put the QR codes as a tour guide with different options for the tourist.
- **Wearables (or wearable devices)** are also becoming more prevalent in the everyday lives of tourists. The use of these products is expected to grow by around 17.65% by 2026.
- **Voice control technology**⁸ offers various benefits for those in the tourism industry, helping to improve the customer

⁸ Rebels, G. (2022, January 1). *2021: the year of tourism's digital revolution - Good Rebels*. Medium. <https://medium.com/@goodrebels/2021-the-year-of-tourisms-digital-revolution-7861727048cd>

experience by increasing personalization and streamlining other services.

- Another relevant aspect on which destinations should focus is *the analysis of data*⁸ captured by public Wi-Fi, sensors, websites or social media, among others. These data allows to make specific and high-impact decisions, both within the organisation and for tourists. There are two types of data that can be analyzed:
 - ♦ **Big Data:** in destinations with high volume of data which is often not connected, and needs to go through a long standardization process carried out by an expert data scientist.
 - ♦ **Small Data:** which focuses on the acquisition and analysis of specific data that requires less operational effort, as it does not involve specific processing systems nor expert data scientists. An example of small data is the analysis of social media metrics, such as the impacts achieved, website analytics or the treatment of user information.
 - **Chatbots** are solving various problems in the travel sector. Chatbots can easily resolve the routine queries of the clients. This
-

enables human employees to focus on resolving complex customer problems, and performing other managerial tasks, that actually require human intervention. Chatbots are not only available when required, but also bring an added level of personalization when it comes to helping customers⁹.

- *Virtual reality VR can be used in many different ways in the tourism industry. The technology is evolving at a rapid rate and the uses of VR within tourism is expanding along with the technology. The main VR technologies that are used in the travel industry are VR video and VR photography⁹.*

A VR tourism video works much like a normal video. They can be viewed on social media or websites, but unlike a regular video, the user is able to explore the entire scene whilst the video is playing¹⁰.

VR tourism videos are captured using specialist cameras known as omnidirectional cameras. These cameras film every angle of the destination at once. After filming, the footage is taken back to the

⁹ *How Technology Is Changing The Travel Industry*. (2019, October 24). <https://appwrk.com/how-technology-is-changing-the-travel-industry>. Retrieved November 30, 2021, from <https://appwrk.com/how-technology-is-changing-the-travel-industry>

¹⁰ *Immersion VR*. (2019, November 19). *VR For Tourism - The Future Of The Travel Industry*. <https://immersionvr.co.uk/about-360vr/vr-for-tourism/>

studio where it is stitched together in order to produce a VR tourism video.

There are 2 types of VR tourism videos¹⁰:

- *Monoscopic VR tourism videos can be viewed on regular devices including mobiles and computers. The viewer can click or drag across the screen in order to rotate the field of view, similar to turning your head to explore a scene.*
- *Stereoscopic VR tourism videos for tourism are produced for VR headsets and they cannot be viewed on a regular device. Although they take more time to produce and are typically more expensive, they provide a more immersive travel experience. These videos feature head tracking so the user can move their head to explore the surroundings in a realistic way.*



Source: <https://www.freepik.com/free-photo/woman-having-fun-home-couch-with-virtual-reality-headset-13882412.htm>

- **Augmented Reality (AR)** Augmented reality is similar to virtual reality, but involves augmenting a person's real surroundings, rather than replacing them.
- **Internet of Things (IoT)** commits to bring significant updates to the tourism industry. They include integrating sensors connected to the Internet inside items like cars, suitcases, buildings, and more. The digitization of destinations has hugely influenced the travel and tourism industry, tourism companies can develop and use mobile apps in order to contact users at

given points, thus, allow them the opportunity to interact with a certain hotel, leisure place, or a museum¹¹.

- In terms of the advantages **blockchain technology**¹² can offer within the travel industry, stability and security rank very highly. The decentralised nature of the blockchain means that information can never go 'offline' or be lost through accidental deletion or a malicious cyber attack, ensuring transactions are always traceable. The most exciting uses for blockchain technology within the hospitality and travel industry are: tracking luggage, identification services, secure and traceable payments and customer loyalty schemes.

- Check this video to see how the blockchain technology

works: https://www.youtube.com/watch?v=SSo_ElwHSd4

- Check this video to see about blockchain technology for

travel: <https://www.youtube.com/watch?v=YpSOzoJ9wCU>

3. Assessment

¹¹ *How Has Technology Improved Travel*. (n.d.). SovereignValley. Retrieved February 19, 2022, from <https://www.sovereignvalley.com/how-has-technology-improved-travel/>

¹² *How Blockchain Technology is Transforming the Travel Industry*. (n.d.). Revfine Optimising Revenue. Retrieved December 5, 2021, from <https://www.revfine.com/blockchain-technology-travel-industry/>

3.1 Knowledge assessment

Question 1 (multiple choice or **true/false**): ICTs empower consumers to identify, customize and purchase tourism products and support the globalization of the industry by providing tools for developing, managing and distributing offerings worldwide.

Question 2 (multiple choice or true/**false**): Just the enhancements in ICTs' capabilities, improved the reliability, compatibility and inter-connectivity of numerous terminals and applications.

Question 3 (multiple choice or **true/false**): Social media websites play one of the most important role within the travel industry, as tourists use these platforms to share online content related to their trips.

Question 4 (multiple answers correct): Which of the following are a new technological approaches to safeguard the heritage tourism:
[smart tourism destinations] [diversify cultural tourism] [skill up languages] **[big data analysis]**

Question 5 (multiple answers correct): Which of *these technologies are creating a new global marketplace, which is more competitive*:
[VOIP] [QR codes] [chatbot] **[GIS]**

Question 6 (multiple answers correct): The benefits of the Virtual reality are:
[Virtual tours can not serve as a starting point for alternative tourism]
[People with disabilities and limited mobility will be able to experience the sensation of recreation through a virtual tour] **[Viewers can take part in activities, travel to different locations, and visit different destinations.]**
[virtual tours can be visualized only in 3D]

Question 7 (multiple answers correct): *Voice control technology offers various benefits for those in the tourism industry*:

It can interpret words if you don't speak clearly

You can use text-to-speech in real-time

The software can spell the same ability as any other writing tool

Helps those who have problems with speech or hearing.

Question 8 (matching): Match the terms with their definitions.

Term 1 **Blockchain**: is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system.

Term 2 **Virtual reality (VR)** refers to computer-generated environments or realities that are designed to simulate a person's physical presence in a specific environment that is designed to feel real.

Term 3 **The Internet of Things (IoT)** is a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices and send and receive data.

Term 4 **Cognitive computing** describes technologies that are based on the scientific principles behind artificial intelligence and signal processing, encompassing machine self-learning, human-computer interaction, natural language processing, data mining and more.

Term 5 **Information and Communications Technology (ICT)** is technology that is used to handle communications processes such as telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions.

Question 9 (matching): Match the concepts with their explanations.

Concept 1 **Augmented reality** has many different implementation models and applications, but its primary objective is to provide a rich audiovisual experience. It works by employing computerized simulation and techniques such as image and speech recognition, animation, head-mounted and hand-held devices and powered display environments to add a virtual display on top of real images and surroundings.

Concept 2 **A wearable device** is often used for tracking a user's vital signs or pieces of data related to health and fitness, location or even his/her biofeedback indicating emotions.

Concept 3 **QR code** can be used to share multimedia content, such as a website landing page or an entire e-guide.

Concept 4 **Smart tourism**: refers to the application of information and communication technology, such similar to the smart cities, for developing innovative tools and approaches to improve tourism.

Concept 5 **big data** reflects the changing world we live in. The more things change, the more the changes are captured and recorded in to it.

Question 10 (matching): Match the problems with their solutions.

Slow and inefficient problem solving: To incorporate and prepare new digital channels for serve the tourist, physical offices, such as instant messaging or messages direct such as Whats App, Telegram, Chatbots, Social Networks or tools of videoconferencing that when viewing the person who attends destination offer more proximity, security and credibility.

Maintain health and hygiene protocols: Identify solutions that promote contactless technology, capacity control and recommended social distance.

Travel restrictions and lockdown: *virtual access to museums, Travel restrictions, heritage sites, theaters and performances, by using Augmented reality or virtual reality.*

Insecurity and opaque transactions when traveling internationally: *The blockchain technology can make the transfer and storage of this information easier and more secure, since responsibility is shared by an entire network. The same is the case with payments abroad, which increases the level of trust between all parties.*

Lack of quality of the experiences for visitors and the quality life for locals: Smart Destinations

3.2 Skills assessment

As we have seen in this module, there is a trend of making destinations and cities Smart. You can check in the following link, which are the European Capitals of Smart Tourism from the European Commission: https://smart-tourism-capital.ec.europa.eu/cities_en

For this assessment try to identify the elements that your city or region is developing in the four categories of a Smart tourist destination:

Accessibility

Accessibility includes services that are multilingual and digitally available to all travelers and visitors, regardless of their age, cultural background or their physical disability.

Sustainability

Being sustainable does not only mean to manage and protect your natural resources as a city, but to reduce seasonality impacts on the environment and to involve the local community.

Digitization

A digital city uses digital technologies to enhance all aspects of the tourism experience, enabling simpler access to services for all travelers, as well as to help local businesses to grow.

Cultural Heritage

Protect and capitalize on the cultural heritage as well as local potential and its creative assets for the benefit of the tourism destination, the industry and the visiting tourists in general

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