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D 2.5 – Catalogue of digital solutions of the tourism ecosystem

DIGITOUR - Boosting the tourism sector in Europe through digital tools and innovation

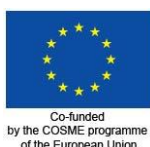
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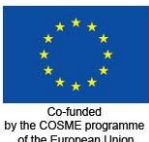


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Project deliverable

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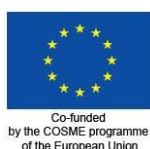


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1. Introduction

The tourism sector is a main economic activity in the European Union with a significance impact on economic growth, employment, and social development.

The EU's tourism industry is made up of 2.3 million businesses, primarily small and medium-sized enterprises (SMEs), employing an estimated 12.3 million people. In 2018, the 'travel and tourism' sector directly contributed 3.9% to EU GDP and accounted for 5.1% of the total labor force (European Parliament).

The tourism industry has now the opportunity to undergo changes towards more sustainable offers, more digitised services, and innovative forms of touristic activities. Whereas other sectors have succeeded in incorporating digital applications and have significantly increased their level of digitalisation in services over the last decade, the tourism sector has not reached the same level of digitalisation and e-business, mainly to the conservative character of tourism SMEs. In addition, the tourism sector faces a series of challenges such as the green and digital transition.

However, due to the outbreak of COVID-19 pandemic the SMEs accelerated their digital tools to be able to stay resilient.

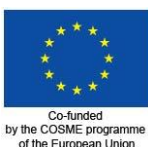
Therefore, in order to assist tourism SMEs in discovering possibilities, giving them inspiration on the modernisation of their services, and helping them in defining what digitisation approaches fit best, the document map existing digital solutions and technologies of interest for the tourism ecosystem.

As the User needs and requirements shows, the needs of the tourism SMEs can be very different. The data collected from the survey of needs and requirement reflects that some of the SMEs are in a first stage of digitalisation, while others are in a very advanced stage of digitalisation, for instance experimenting with augmented reality to offer their clients new experiences.

Therefore, this mapping exercise will cover a wide range of solutions based on the User Needs and Requirements (A.2.2).

This document has been created including data about:

1. Identification and mapping of existing digital solutions in relevant areas for the tourism SMEs and technologies that are of interest for these areas but are not yet fully adapted or implemented.
2. Identification and mapping of digital solutions from other sectors that could be adapted to the tourism industry.
3. Identification and mapping of relevant technology providers among the consortium members and in Europe for those solutions.



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4. Identification of digitisation experts and best practices from the tourism ecosystem, which will help to give a practical approach and inspiration to the SMEs.

2. Deliverable summary

2.1 Deliverable abstract

The outbreak of COVID-19 has put the EU tourism industry under unprecedented pressure and tourism companies of all sizes are facing acute liquidity problems, especially SMEs.

The main ambition of DIGITOUR is to provide SMEs from the tourism sector with the digital tools and technologies to improve their competitiveness and resilience. In particular, DIGITOUR aims to enhance their knowledge of digital tools and to boost innovative ideas for digital solutions and improve foster cross-sectoral and cross-border partnerships among tourism sector SMEs, stakeholders and digital providers.

This deliverable provides a map of digital solutions that either already exist in the tourism ecosystem and digital solutions applied in other sectors. Moreover, a map of digital providers and experts can be found on this deliverable.

These solutions are of many scopes, such as Internet of Things, booking systems, Customer Relationship Management (CRM), Digital advertisement, social media among others.

2.2 Deliverable objectives

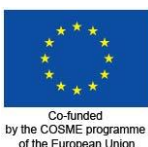
Tourism SMEs need to respond to the new era by upskilling their digital knowledge, boosting innovative sustainable ideas and solutions.

The purpose of this deliverable is to find and map digital solutions based on the User needs and requirement deliverable. It covers a wide range of solutions, as the needs of the tourism SMEs can be very different. The questions to be answered by this deliverable:

- Mapping of existing digital solutions in relevant areas for the tourism SMEs.
- Mapping of digital solutions from other sectors that could be adapted to the tourism industry.
- Identification of digitisation experts and technology providers.

3. Scope, use and impacts of the deliverable

3.1 Scope of the deliverable



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The tourism industry has now the opportunity to face changes towards more digitized services and innovation activities with the purpose to improve their resilience. The scope of this deliverable is to identify and map digital solutions available in Europe.

3.2 Use of the deliverable

The potential use of this deliverable is to serve as a reference for the rest of the DIGITOUR project and for European SMEs that are interested in boost innovative solutions in their activities.

3.3 Impacts of the deliverable

This delivery identifies a wide range of digital solutions that are interested to the SMEs from the tourism ecosystem. The main direct beneficiaries of this results are the SMEs selected for the financial support of the DIGITOUR project.

This delivery is also defining the areas of solutions to be addressed in the next phase of the project, the deliverable 2.7 Call for Expression of Interest.

The delivery will be published for all the partners of the project and for the SMEs interested on participating in DIGITOUR.

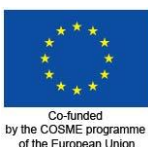
4. Preparation and development of the deliverable

4.1 Preparation stages and deliverable development

The main steps of the development and preparation of Call for Expression of Interest are listed below:

- Analysis the Deliverable 2.2.3 User Needs and Requirements. The deliverable provided us an insight into the current situation and knowledge about the needs and requirements of the European SMEs in digitalisation.
- Review of the literature on digital trends in the tourism sector.
- A Survey on Mapping of Digital Solutions was created with the purpose to disseminate it to the consortium partners and some tourism clusters from Spain. The aim of this survey was to collect the different digital solutions and providers suggested by the partners of DIGITOUR.
- The Transition Pathway for Tourism¹

¹ <https://op.europa.eu/en/publication-detail/-/publication/404a8144-8892-11ec-8c40-01aa75ed71a1>



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5. Contents and annexes

5.1. Digital transition for the Tourism Ecosystem

Industry 4.0 describes the organisation of production processes based on technology and devices autonomously communicating with each other along the value chain, it is a model of the smart factory. The “internet of things” is considered element of Industry 4.0.

The industry 4.0 inspires the new perception of tourism. To continue alive in the tourism sector after the COVID-19 pandemic, the entities involved in the tourism ecosystem have been exploring options around Industry 4.0. Some of these solutions are explained in the next chapters such as augmented reality. Tourism 4.0 aims to improve the added value to tourism through innovation and technology.

5.2. Sustainability in tourism

Sustainability principles refer to the environmental, economic, and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability.

A sustainable tourism SMEs aims to focus on:

- Make optimal use of environmental resources and helping to conserve natural heritage and biodiversity.
- Respect the socio-cultural authenticity of host communities, conserve the traditional values.
- Ensure stable employment.

Regarding to the climate action to be done by the tourism ecosystem. The tourism ecosystem is highly vulnerable to climate change and at the same time contributes to the emission of greenhouse gases. Speeding up climate action in tourism is very relevant to the resilience of the sector. Climate action is defined as the effort to measure and reduce GHG emissions.

The Covid-19 pandemic caused overwhelming social and economic impacts, however, the halt in activity meant a reduction in GHG emissions. The Covid-19 pandemic meant a 7% reduction of GHG emissions globally in 2020, providing a reference to the magnitude of the effort that should be done to achieve the goals of the Paris Agreement.

According to World Tourism Organization (UNWTO), CO₂ emissions from tourism are forecasted to increase by 25% by 2030 from 2016 levels. Therefore, the need to scale up climate action in tourism remains urgent.

Among this deliverable, sustainable solutions are explained. Furthermore, we would like to outline some examples of how to be a sustainable green business in the tourism



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ecosystem.

Firstly, in case of the tourism and accommodation SMEs that aim to increase their energy efficiency and renewable energy usage. Today there are several solutions that can be used in the sector such as: electric appliances with high energy efficient rating, key card systems to switch off electricity in guestrooms, energy saving light bulbs...

5.3. Identification and mapping of existing digital solutions and technologies of interest for the Tourism ecosystem

Tourism is one of the most heavily hit ecosystem by the COVID-19 crisis. Tourism Small and Medium enterprises have accelerated the digitalisation of their activities to the new situation. As result the tourism ecosystem applied digital tools to become more resilient.

In this chapter, the existing digital solutions and technologies for the tourism ecosystem are explained. The mapping of solutions is classified by the main focus area of the SMEs.



5.3.1. Data-driven destination management models and mechanisms

5.3.1.1. Social Media

Online platform is one of the most popular ways of communication and people use tools like social media and blogs to share information. In tourism this is one of the best ways



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to get information about specific destinations or businesses.

Social network has become one of the most trusted sources of information, tourists share their experience, photos and opinions there.

For a significant proportion of tourists, the online environment is a highly relevant source of information when planning their trips. For this reason, it is of special relevance for agents in the tourism industry to develop an online strategy that favors the information search process of potential travelers.

Campaigns based on experience marketing, fam trips or recommendations of well-known characters that are relevant to the traveler.

The User Needs and Requirement survey responded by 128 SMEs shows that 95% of the respondents communicate their products/services by digital communication way. The interviewed companies use web as the main digital communication tool and 91% of the respondents use a combination of web page and social media. 32% of the respondents use also blogs as digital communication tool.

Today there are several social media platforms that can be used by the tourism SMEs to announce their business:

- Facebook
- Instagram
- LinkedIn
- TikTok
- Twitter
- Youtube

5.3.1.2. Digital concierge

In the tourism sector there is the possibility to use a digital concierge to encourage the check-in process. Today there are several online platforms providing digital tools for check-in process such as:

- VIKEY² is an Italian startup providing a virtual concierge to speed up the check-in process.

5.3.1.3. Booking platforms

A booking platform is a software solution used for reservation management. The customers can see all the available options on the website and book the ones they need.

Before such systems were available, the tourism entities enter the information manually. Booking platform simplifies the booking process for the entities and eliminate the risk associated with manual and human error. Most of the respondents of the survey have a

² <https://vikey.it/en/how-self-check-in-works/#concierge>



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booking system.

Today there are several booking platforms such as:

- Airbnb³
- Booking.com™⁴
- Expedia⁵
- Hotelbeds⁶
- Hotels.com⁷
- Jet2holidays⁸
- Jumbo Tours⁹
- KAYAK¹⁰
- One Inventory from Amadeus¹¹
- RateHawk¹²
- Tripadvisor¹³

5.3.1.4. Mobile app for Tourism

The aim of some tourism entities app is to provide the customers with all the information and travel support they need. Customers will use the mobile application from the beginning to the end of their trip. One example of these tourism applications is:

- AirHelp: The app solves flight problems.
 - Cancelled flights
 - Flight delays
 - Missed connections
 - Uncooperative
- Eurail (Europe at your fingertips): This app offers:
 - Look up train times offline
 - Plan your whole trip
 - Board with confidence
 - Book your reservations
 - Get extra discounts

³ <https://www.airbnb.es/>

⁴ <https://www.booking.com/>

⁵ <https://www.expedia.es/>

⁶ <https://www.hotelbeds.com/home>

⁷ <https://www.hotels.com/>

⁸ <https://www.jet2holidays.com/>

⁹ <https://www.jumbotours.com/>

¹⁰ <https://www.kayak.es/?ispredir=true>

¹¹ <https://amadeus.com/es/catalogo/turoperadores/one-inventory>

¹² <https://www.ratehawk.com/lp/es/rh/>

¹³ <https://www.tripadvisor.com/>



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- Get Your Guide¹⁴
- Maps.me: the app offers:
 - Free offline maps
 - Navigation for different types of transport
 - Hotel bookings
 - Travel guides
 - Explore different countries and cities
 - Catalogue (Entertainment, Attractions, Business, Lodging, Shops, Health, Food, Education, Transport, Finance)
- Mi ruta: A web solution that allows you to create a personalized tourist route according to the points of interest the customers want to visit. The user has a list of points of interest created by an administrator or by the users themselves, and the route is automatically generated so that you can visit all the selected ones.
- Moovit MaaS platform. MaaS is an urban mobility platform that use a range of tools, including branded mobility apps, mobile payments, urban mobility analytics, and on-demand and pre-scheduled transit. Moovit MaaS includes:
 - Branded Apps
 - Fare Payments
 - Urban Mobility Analytics
 - On-Demand Solutions
 - Real-time Transit Information for Buses
 - Transit Data Manager
- Showaround¹⁵
- Skyscanner¹⁶
- Splitwise (Google App): Splitwise is one way to keep track and make sure everyone pays their fair share.
 - Keep the accounts and divide the expense between friends, roommates or any person. Their expense manager is handy for managing accounts and keeping an eye on your budget.
 - A simple user interface. At a glance customers will see how much they owe their friends, their budget, accounts payable and financial expense account.
- Uber: This technology helps develop and maintain multisided platforms that match consumers looking for rides and independent providers of ride services, as well as with other forms of transportation, including public transit, bikes, and scooters:
 - Ride options
 - Moving cities forward
 - Uber Eats

¹⁴ <https://www.getyourguide.es/>

¹⁵ <https://www.showaround.com/>

¹⁶ <https://www.skyscanner.es/?previousCultureSource=COOKIE&redirectedFrom=www.skyscanner.com>



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- Helping businesses move ahead
- Earning with Uber

There are also some applications that links to the information of public administration, specially relevant in the health situation that the tourism sector is facing.

- GOGRILLO: it allows tourists to have access to all the information and different restrictive measures that public administrations will put in place to contain the health emergency. It stills in its launching phase, this platform is the result of the collaboration between several startups such as Hearth, Pem Cards, Europass Assistance, Tibiiki, My Take It and Sharewood.

5.3.1.5. Customer relationship management (CRM)

Client database and sales management is a technology for managing all the company's relationships and interactions with customers and potential customers. The goal is to improve business relationships to grow your business. A CRM system helps companies stay connected to customers, streamline processes, and improve profitability.

Today there are several CRM that can be apply to the tourism sector such as:

- CAS genesisWorld from CAS CRM¹⁷
- CDP Tourist destination by Arenametrix¹⁸
- CRM of the Destination by Wiongo¹⁹
- CRM for the tourism and leisure industry by Efficcy.
- ITT web²⁰
- Microsoft Dynamics 365 Sales, expert providers such as Travel Operations²¹ or Aitana²².
- QuoHotel for Marketing by QUOnext²³
- S4G sales force²⁴

5.3.1.6. Digital Advertising Management Platform

The purpose of the digital advertising management platform is to promote the activity of

¹⁷ <https://www.cas-crm.com/products/cas-genesisworld.html>

¹⁸ <https://arenametrix.com/en/crm-tourist-destination/>

¹⁹ <https://wiongo.com/en/crm-of-destination/>

²⁰ <https://ittweb.net/it/prodotti-servizi/vtenext/crm>

²¹ <https://traveloperations.com/microsoft-gold-partner/>

²² <https://www.aitana.es/soluciones/dynamics-365/>

²³ <https://www.quonext.com/sectores/crm-hoteles>

²⁴ <https://s4g.es/en/>



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the entity, attract customers and put it on the map.

The use of online adverts and social media platforms is playing a key role in the way of advertisement in the tourism SMEs.

It should be emphasized the importance of measure the performance of the digital marketing media with tools such as google analytics for the web page and analytics for social media.

Some examples of these digital advertisement management platform are:

- Adtelligent²⁵
- Bannerflow²⁶, the platform supports every stage of the campaign lifecycle, from ad creation and campaign management to performance optimisation and personalisation.
- Celtra²⁷
- Creatopy²⁸
- Digitwist²⁹, web marketing
- Mediawide³⁰, advertising and marketing
- Marketing solutions Amara³¹
- Somplo³²

5.3.2. Operations

5.3.2.1. ERP

ERP stands for enterprise resource planning. It's software that manages a company's financials, supply chain, operations, commerce, reporting, manufacturing, and human resource activities.

An ERP software for tourism SMEs reduce operational costs and boost efficiency and productivity. ERP is a useful business software that manage every business process.

The User Needs and requirement survey shows that surprisingly, 46 from 136 respondents answered that they do not use digital accounting system at, all which makes

²⁵ <https://adtelligent.com/>

²⁶ <https://www.bannerflow.com/solution/industry/travel/>

²⁷ <https://celtra.com/creative-automation/for-advertising-and-marketing/>

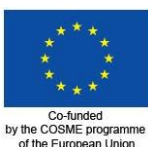
²⁸ <https://www.creatopy.com/solutions/enterprise/>

²⁹ <https://www.digitwist.fr/>

³⁰ <https://www.mediawide.com/advertising>

³¹ <https://www.amara-marketing.com/en/solutions?sector=turismo>

³² <https://somplo.com/products/>



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33,8% of all respondents.

Examples of ERP for some kind of tourism SMEs are:

- ELINEXT³³
- Microsoft Dynamics 365 BC
- OdoO Tours & Travel Management³⁴: It is a cloud-based software system designed by OpenERP for building websites and managing business activities. It includes among others: Accounting, API, Billing, CRM, E-Commerce, Enterprise Social Network, Expenses, Manufacturing Resource Planning, Project Management, Purchase, Website Builder...
- QuoHotel by Quo next³⁵: a solution that integrates the operational area (PMS) with other areas of the company: financial and purchasing (ERP), additional services, Marketing and sales (CRM)... it also has other management solutions for airlines, airports, receptive agencies, theme parks and leisure spaces.
- QuoTravel by Quo next³⁶
- Travel IMS by Hiberus³⁷

5.3.2.2. Digital identity verification

- Mobbeel³⁸: it allows companies to verify the identity of their customers in seconds. It also offers digital onboarding solutions, electronic signature, and biometric authentication.

5.3.2.3. Payments

- Scalapay³⁹: this platform allows payments in three different installments in order to facilitate customers' experiences and payments for goods to be bought online. An adaptation to the travel industry is still in progress and travel market's interest in Scalapay is growing as an opportunity to "buy now, pay later".

5.3.3. Innovative tourism services using advanced technologies

5.3.3.1. Internet of Things (IoT)

Internet of things (IoT) is a set of technologies that allow the physical tourist space to be integrated with the virtual space through sensors, beacons, touch screens, QR codes,

³³ <https://www.elinext.com/erp/travel/>

³⁴ <https://www.odoo.com/>

³⁵ <https://www.quonext.com/sectores/software-turismo>

³⁶ <https://www.quonext.com/sectores/software-agencias-viaje>

³⁷ <https://www.hiberus.com/en/technological-solutions-tourist-sector>

³⁸ <https://www.mobbeel.com/en/industries/travel/>

³⁹ <https://www.scalapay.com/es>



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contactless —important for post-COVID-19 check-in checkout—, wearables or objects connected to internet that interact with the tourist. It enables travelers to control more appliances or services through a centralised device, such as a tablet or mobile application.

IoT allows tourism SMEs to collect a large amount of information to get to know better customers and offer them experiences that are more in line with their preferences.

Moreover, IoT helps companies improve their energy efficiency and combat climate change, by being able to monitor and optimize temperature, light and energy consumption in general.

IoT is currently a digital tool that is developing within the tourism sector and some existing solutions are:

- M2M IOT⁴⁰ by Solid solutions
- Smart Tourism by Libelium⁴¹: some examples of what Smart tourism offers for tourism are:
 - Temperature control for fever screening.
 - Indoor occupancy control
 - Crowd and traffic tracking: Parking space detection
 - Air quality and pollution detection: Weather conditions prediction and UV radiation measuring.
 - Fire prevention.
 - Water quality monitoring.
- Tourism and leisure by Telefónica Tech⁴²

5.3.3.2. Augmented Reality

Augmented reality is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information.

The AR technology has similarities with virtual reality, but AR does not replace the real-world environment, but augments it by overlaying digital components.

Among the different uses of the Augmented reality on the tourism sector could be found:

Hybrid physical-digital signposting to facilitate movement around the destination which is especially relevant in accessible tourism, innovation in the tourist guide and in the network of tourist information points, gamification, recreation, or even the recovery of lost heritage.

Offer a try-before-you-buy experience which will give people a taste for travel again

⁴⁰ <https://www.solidsolutions.es/index-en.html#plataform>

⁴¹ <https://www.libelium.com/iot-solutions/smart-tourism/>

⁴² <https://aiofthings.telefonicatech.com/en/technology-services/data-mobility-profiling/tourism-insight>



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leading to more holidays being booked.

For instance, allows hotel owners to promote their accommodation via an interactive marketing experience.

Augmented reality is currently a digital tool that is developing and growing within the tourism sector and some existing solutions are:

- ARACAST® DIGITAL SIGNAGE⁴³
- Brújula⁴⁴, intelligent device management and monitoring, focused on data capture and analysis for the improvement of facility management cost-efficiency and the development of unique and personalized experiences for the customer. Some solutions: Smart Room (personalized experience), smart mirror, active communication during trips, geolocation systems for security, energy efficiency and monitoring, water resource management optimization, predictive maintenance and smart stock.
- Invelon⁴⁵
- Prexenz⁴⁶
- Virtualgeo⁴⁷

5.3.3.3. Virtual reality

Virtual reality allows recreation of cities, monuments, and museums both in their current appearance and previous times. Virtual reality incorporates information and interactive experiences that allow tourist to revive history and increase interest in the place.

- Invelon⁴⁸
- Prexenz⁴⁹

5.3.3.4. Geolocation

- Arrivalist⁵⁰, Geolocation intelligence for travel. Arrivalist is a visitation intelligence company that provides actionable insights on consumer behavior, competitive share, media effectiveness, and market trends.
- Flow Control: Obtaining in real time the positioning of visitors at the destination and dumping this information on a control panel with heat maps, etc. Additionally,

⁴³ <http://www.aracast.com/en/sectores/leisure-tourism-transportation/>

⁴⁴ <https://www.brujula.es/en/solutions/internet-of-things-iot/>

⁴⁵ <https://invelon.com/en/tourism/>

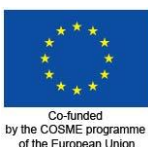
⁴⁶ <https://www.prexenz.com/index.html#work>

⁴⁷ <https://virtual-geo.com/en/>

⁴⁸ <https://invelon.com/en/virtual-reality/>

⁴⁹ <https://www.prexenz.com/index.html#work>

⁵⁰ <https://www.arrivalist.com/>



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warnings and alerts are scheduled for when a capacity limit is exceeded in a given location.

5.3.4. Infrastructure

5.3.4.1. Cloud-based storage service

- Amazon Drive
- Apple iCloud
- Google drive: a free cloud-based storage service that enables users to store and access files online. The service syncs stored documents, photos and more across all of the user's devices, including mobile devices, tablets and PCs.
- One Drive

5.3.4.2. Video conferencing systems

A type of online meeting where people engage in a live audio-visual call. It allows the participants see, hear, and talk to each other in real time, no matter where in the world they are. Some of the video conferencing systems more used are:

- Google meets
- Microsoft Teams (Dynamics 365)
- Zoom

5.4. Identification and mapping of relevant technology providers

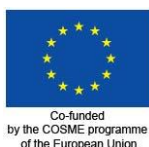
In this chapter of the deliverable, technology providers have been funded and mapped with the purpose of map digital solutions that will support SMEs in the tourism sector.

Large digital providers that offer multiple solutions for the tourism sector such as:

- Accenture
<https://www.accenture.com/>
- Amadeus
<https://amadeus.com/>
- Amara
<https://www.amara-marketing.com/en/solutions>

Amara offers inbound marketing, CRM, website development, social media management, content creation, branding and sales among other services.

- Arenamatrix
<https://arenamatrix.com/en/>



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Arenamatrix is an all-in-one, easy-to-use web application for structures of any size. Arenamatrix offers CRM, marketing campaigns, business development, sales reporting and revenue management.

- Avaibook

<https://www.avaibook.com/>

Comprehensive management systems for accommodation.

- Booking

<https://www.booking.com/>

Booking connects millions of travelers to experiences, a variety of transportation options, and places to stay. As one of the world's largest travel marketplaces for both established brands and entrepreneurs of all sizes, Booking.com enables properties around the world to reach a global audience and grow their businesses.

Booking.com B.V., registered in Amsterdam, provides an online accommodation reservation service. Internationally, Booking.com is supported by companies worldwide. They are committed to operating business sustainably and building a culture of sustainability and collaborating to decarbonise the industry.

- Brujula

<https://www.brujula.es/en/solutions/>

Some of the solutions that Brujula offers are data analytics, app development, IoT, security, digital processes and digital business.

- Capgemini España

<https://www.capgemini.com/es-es/>

Capgemini offers services about artificial intelligence, cybersecurity, business operations, cloud services and technology solutions among others.

- Deloitte

<https://www2.deloitte.com/global/en.html>

- Giger

<https://www.gingerjuice.co.uk/>

Leading travel marketing agency, they help tourism companies in developing their social media strategies and to implement their plans.

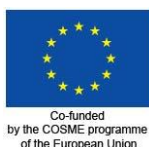
- GFT IT Consulting

<https://www.gft.com/es/es>

GFT offers technological solutions about artificial intelligence, blockchain and cloud.

- Grupo Barrabés

<https://www.barrabes.biz/en/>



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Barrabés is involved in rural development of SMEs through creating innovative and flexible solutions for SMEs.

- GVAM

<https://www.gvam.es>

GVAM, as a technological development company for the cultural and tourism sector, with real specific solutions and operational phase:

- Visiting tools: Development of web portals and APPS/PWA for the tourist visit, containing and publishing digital content in audiovisual format through its own CMS, in real time. Intuitive navigation allows access to predefined routes and itineraries, which at the same time contain points of tourist interest.
- Visitor Planner: Through the creation of a repository, the set of resources and tourist activities in question are entered automatically or manually. These resources are sorted and classified by multiple categorization tags that help their description. The front office part consists of a short form where the tourist inserts his profile (dates, age, origin, type of visit, interests,). From then on the tool searches, organizes and displays a custom itinerary for the items defined from the catalog references.

- Hiberus

<https://www.hiberus.com/>

- Histories

<http://www.histories.it/>

Histories provides digital, innovative contents related to cultural heritage to enhance its touristic attractiveness.

- Indra

<https://www.indracompany.com/>

- Ittweb

<https://ittweb.net/it/crm-agenzie-viaggi>

CRM for travel agencies.

- Libelium

<https://www.libelium.com/>

Libelium designs and manufactures technological solutions to make the Internet of Things possible. Their aim is to help companies and cities benefit from the full potential of IoT to achieve a more competitive, sustainable and datacratized society.

- Mastercamping

<https://www.mastercamping.com/>

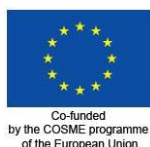
Comprehensive campsite management program.



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- Odoos
<https://www.odoo.com/>
Odoos apps are perfectly integrated with each other, allowing you to fully automate your business processes.
Odoos providers: In Germany IFE GmbH and OBS Solutions GmbH.
 - In Denmark VK DATA ApS .
 - In Spain PROCESS CONTROL SCCL and LANDOO Sistemas de Información S.L. In France Apik and Captivea
 - In Italy Openforce srls Unipersonale and Rapsodoo Italia S.r.l.
- Ready4digital
<https://www.ready4digital.com/services/>
- Ruralgest
<https://www.ruralgest.com/>
Rural gest provides channel manager, PMS, reservation software and management programs for rural houses, hotels and destinations.
- Seidor
<https://www.seidor.com/en-es>
Seidor offers ERP ecosystem, cybersecurity, data analytics and cloud.
- Smartvel
<https://www.smartvel.com/>
Smartvel is a Travel Content Technology vendor specialized in providing content solutions for the Travel Industry. They help companies inspire their travelers on what to do in any destination at any stage of the journey.
- SopraSteria
<https://www.soprasteria.com/>
Sopra steria offers a wide range of solutions of different field: consulting, technology services, systems integration, software, cybersecurity and business process services.
- T-Systems
<https://www.t-systems.com/es/es>
T-Systems offers solutions of advisory, digital services, security and cloud services.
- TelefónicaTech
<https://aiofthings.telefonicatech.com/en/sectors/tourism-leisure>
Telefónica Tech offers to private entities to obtain a 360° view of tourists in order to anticipate their needs and adapt to the needs and demands of visitors. A permanently connected tourist in search of personalised experiences. Data from our mobile network, together with technologies such as Big Data, AI or IoT, become



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essential allies in understanding behavioural patterns and improving tourist amenities.

- Utopic
<https://utopic.it/it/>
- Viewnext
<https://www.viewnext.com/>
- Vikey
<https://vikey.it/en/home-page/>
Vikey offers self check-in and domotics. Companies will be able to set automatic rules to turn the air conditioning and heater off once guests leave the facility with the purpose in limit waste and save energy.
- Wiongo
<https://wiongo.com/>
Leading Smart Destinations, Wiongo offers CRM and wiongo platform which allows to collect among of data about their customers. The platform provides a detailed, global view of each potential customer, which can at the same time be used for personalised marketing and promotional activities with specific objectives.
- Wontech
<https://wontech.es/>

5.5. Identification of digitisation experts and best practices from the tourism ecosystem

- Aragon Sustainable Tourism Cluster Association (Asociación cluster de turismo sostenible de Aragón TSAC)⁵¹
- European cultural tourism network (ECTN)⁵²
- European network for accessible tourism (ENAT)⁵³
- European travel commission⁵⁴
- GOazen cluster of tourism⁵⁵
- Hotel Technological Institute (Instituto Tecnológico Hotelero ITH)⁵⁶

⁵¹ <https://tsac.es/>

⁵² <https://www.culturaltourism-network.eu/>

⁵³ <https://www.accessibletourism.org/>

⁵⁴ <https://etc-corporate.org/>

⁵⁵ <https://www.bayonne.cci.fr/article/goazen-le-cluster-tourisme-du-pays-basque>

⁵⁶ <https://www.ithotelero.com/>



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- Longarone Fiere SRL⁵⁷
- NEST – Tourism innovation center in Portugal: Fostering digitalization of European Tourism SMEs.⁵⁸
- Network of Smart Tourist Destinations (Red de Destinos Turísticos Inteligentes RDTI)⁵⁹
- Secartys⁶⁰
- Segittur⁶¹
- Smart Tourism Practices in Europe⁶²
- Spanish Association of Scientific Experts in Tourism (Asociación Española de expertos Científicos en Turismo AECIT)⁶³
- Spanish Registry of Clusters⁶⁴ (Registro Nacional de Agrupaciones Empresariales Innovadoras -AEIs-), subgroup of Tourism clusters.
- Thinktur, tourism technology platform⁶⁵
- Tourism Business Portal European Commission⁶⁶
- Venetian Cluster⁶⁷

⁵⁷ <https://www.longaronefiere.it/>

⁵⁸ <https://nestportugal.pt/>

⁵⁹ <https://www.destinosinteligentes.es/>

⁶⁰ <https://www.secartys.org/>

⁶¹ <https://www.segittur.es/>

⁶² https://smart-tourism-capital.ec.europa.eu/leading-examples-smart-tourism-practices-europe_en

⁶³ <https://aecit.org/>

⁶⁴ <https://clusters.ipyme.org/es-es/Identificar/Paginas/ListadoAEI.aspx>

⁶⁵ <https://www.thinktur.org/>

⁶⁶ https://ec.europa.eu/growth/sectors/tourism/business-portal_en

⁶⁷ <https://www.venetiancluster.eu/it/>



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5.6. References

[https://www.europarl.europa.eu/RegData/etudes/STUD/2016/570007/IPOL_STU\(2016\)570007_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2016/570007/IPOL_STU(2016)570007_EN.pdf)

<https://www.salesforce.com/crm/what-is-crm/>

https://ec.europa.eu/growth/sectors/tourism/support-business/digital_en

https://ec.europa.eu/growth/sectors/tourism/tourism-transition-pathway_en

PAET 2021-2024 Plan aragonés de estrategia turística

<http://www.europarl.europa.eu/studies>

<https://www.qualitytravel.it/buy-now-pay-later-scalapay-cresce-nel-mercato-travel-con-50-adesioni/105745>

<https://vikey.it/>

<https://corriereinnovazione.corriere.it/cards/viaggiare-sicurigrazie-ad-app-start-up-vademecum-digitale-turisti-albergatori/gogrillo.shtml>

<https://www.etoa.org/>

<https://reporting.clustercollaboration.eu/zone/in-europe>

<https://www.segittur.es/blog/covid-19/soluciones-digitales-para-dinamizar-el-sector-turistico/>

<https://www.forbes.com/sites/solrogers/2020/03/18/virtual-reality-and-tourism-whats-already-happening-is-it-the-future/?sh=c77226428a6a>

<https://www.unwto.org/es/news/herramientas-digitales-para-la-revitalizar-el-turismo>

<https://www.businessinsider.es/sensorizacion-inteligencia-artificial-realidad-virtual-distrto-digital-tiene-nuevas-soluciones-turismo-878351>

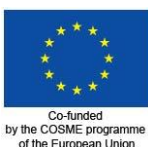
<https://www.ideal.es/economia/digital-tourist-congreso-20210602191828-ntrc.html>

<https://moovit.com/maas-solutions/>

<https://www.unwto.org/sustainable-development>

<https://www.unwto.org/sustainable-development/climate-action>

<https://www.carbonbrief.org/global-carbon-project-coronavirus-causes-record-fall-in-fossil-fuel-emissions-in-2020/>



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