



Tourbit

Fostering digitalisation of
European tourism SMEs

YEAR RELEASE OF TOP TECHNOLOGIES

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PRESENTED BY

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NEST - Tourism Innovation Center



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“BOOSTING THE UPTAKE OF DIGITALISATION, INNOVATION AND NEW TECHNOLOGIES IN TOURISM THROUGH TRANSNATIONAL COOPERATION AND CAPACITY BUILDING”.

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TABLE OF CONTENTS

<u>1.Executive summary</u>	4
<u>2. Context</u>	5
<u>3. Situation Overview</u>	7
<u>4. Stages of Digitalization</u>	13
<u>4.1. Stage 2 - Growing digital: Business as usual is not an option</u>	14
<u>5. Conclusion</u>	30
<u>References</u>	31
Annex 1- List of innovative and commercial ready solutions	

1. EXECUTIVE SUMMARY

This deliverable, D1.2. Year release of top technologies, is provided by the TOURBIT project that aims to support tourism SMEs in the uptake of digitization and innovation by fostering their skills, knowledge and network. The deliverable is increasing digital awareness by introducing state-of-the-art technologies and trends in SME tourism. The deliverable has been provided by doing literature studies of ongoing trends and used technologies as well as gathering information and experiences from TOURBIT partners and their stakeholders relating to a selected set of technologies. This report is the second edition of the Year top release of technologies, which was presented for the first time in May 2022 and which gathered the current trends on technology and tourism at that time and focused on the first level of digitization. The 2023 report will give also an overview on the current technologies, thus providing further insights on the technologies related to the second phase of digitization.

Despite global pressures such as high inflation, the war in Ukraine and the consequent energy crisis, and the looming economic recession, the outlook for travel in Europe seems promising.

Data from European Travel Commission (ETC) shows that by last year, Europe rebounded to 75 per cent of its 2019 or pre-pandemic travel volumes. Although happening at a slower pace the recovery is expected to continue throughout the coming year. The increase in visitors is already expected despite the ongoing pressures of inflation, the war in Ukraine and the resulting energy crisis, according to the report “European Tourism: Trends & Prospects.”

Commenting the publication of the report, Luís Araújo, ETC’s President, said: *“Looking forward to 2023, we expect the tourism sector in Europe to continue its strong rebound. ... As the industry navigates the many challenges it faces this year, it is vital that the sector continues to be receptive to consumer demand, improving the visitor experience at destination and targeting markets and segments less affected by economic slowdown.”*

<https://etc-corporate.org/news/europes-tourism-rebound-predicted-to-continue-into-2023/>

According to global trends, the growth of SMEs in Europe in 2023 may be influenced by several factors. These include a continued emphasis on advancing digital operations across various value chains, prioritizing critical skills for employees, an increased attention on environmental, social, and governance (ESG) issues, and an ongoing focus on empowering women.

The truth is that SMEs in the tourism domain have utilized digital solutions in various ways but typically on a basic level. That's why in the TOURBIT project, selected emerging technologies have been mapped along three stages according to the level of digitization of the SMEs: 1) Getting ready, 2) Growing digital, and 3) Leaping ahead. This deliverable, Year 2023 Release of top technologies, is focused on the second stage technologies. The first year release in 2022 was focused on the first stage technologies even if it also introduced other stages by providing at the same time the wholeness and base of the digitization status in tourism SMEs. The following ones will be published in March 2024 and it will be focused on according to the third stages of digitization.

2. CONTEXT

The TOURBIT project is aimed to boost the uptake of digitalization and innovation of tourism SMEs through transnational cooperation and capacity building. This deliverable is focused on Special Objective 1 (SO1) of TOURBIT project: "Create and spread knowledge on new, innovative technologies and solutions in the area of digital and smart tourism, helping tourism SMEs realize the benefits derived from digitalization and innovation through a knowledge open-sharing platform".

In this deliverable the tourism sector is understood in its broadest sense covering various tourism activities, from accommodation, transportation (air, rail or maritime), online travel agencies (OTA), tour operators, restaurants, activities or resorts, destination management as well as travel technology or digital tourism. This deliverable is the second launch of the Year Release on the top technologies in tourism SMEs. The first deliverable in Spring 2022 introduced technological approaches and application areas that had been identified contributing to improving the tourism sector while responding to the opportunities in the European Tourism SMEs. In 2022, the introduced technologies were as follows:

- Artificial Intelligence (AI)
- Augmented Reality (AR)
- Blockchain
- Cloud Computing
- Contactless
- Cybersecurity
- Data Analytics

- Internet of Things (IoT)
- Online sales
- Online Travel Agency (OTA)
- Platform economy
- Virtual Reality (VR)

In this year 2023, the activities and updating has been focused on the selected set of technologies being artificial intelligence (AI), cloud computing, contactless, and cybersecurity. This deliverable summarized literature studies done as well as information and experiences gathered from TOURBIT partners.

More detailed information of technologies is introduced in section 3 Stages of Digitalisation.

The deliverable is organized as follows: the introduction section contains an overview of the latest megatrends and forecasting activities in the tourism sector. In addition, the latest technologies, especially top technologies suitable for the tourism sector are introduced.



3. SITUATION OVERVIEW

The travel industry is constantly evolving, and small companies need to be prepared to adapt to these changes in order to remain successful. By keeping up with global travel trends, businesses can anticipate changes in the industry and adjust their business strategies accordingly.

By analyzing global travel trends, they can also gain a better understanding of their customers' preferences and travel behaviours, which can help companies create more targeted marketing campaigns and develop more effective customer service strategies. By keeping up with the latest travel trends, companies should be able to identify new destinations and experiences that are growing in popularity among travelers and this might help to identify new business opportunities and tailor their offerings to meet the changing demands of the market.

Lastly, staying up to date with global travel trends can help small companies stay competitive in their industry, in which by offering unique and innovative travel experiences, small companies can attract more customers and stand out from their competitors.



As covered on Phocuswire, one of the most respected travel research authority and events brands in the world, in 2023 travel companies will focus on improving the customer experience through enhanced use of technology and the top travel industry predictions are:

- **Personalization** will become even more important in the travel industry, with companies using artificial intelligence and machine learning to create customized experiences for travellers.
- The **sharing economy** will continue to disrupt the traditional hospitality industry, with companies like Airbnb and Uber expanding their offerings and entering new markets.
- **Sustainability** is already and will become even more a key concern for travellers, and companies will need to demonstrate their commitment to environmental and social responsibility.
- **Blockchain technology** will gain traction in the travel industry, particularly for secure and transparent transactions.
- **Virtual and augmented reality** will be increasingly used to enhance the travel experience, from virtual tours of destinations to in-flight entertainment.
- The rise of **automation and robotics** will transform the travel industry, with companies using technology to streamline operations and improve efficiency.
- **Data analytics and artificial intelligence** will be continuously used to optimize revenue management, with companies using predictive analytics to forecast demand and adjust the pricing accordingly.
- The rise of **smart cities** will create new opportunities for the travel industry, with companies using technology to create more connected and efficient urban environments.
- **Health and wellness** will become a major focus for the travel industry, with companies offering more wellness-focused experiences and services.
- The growth of the middle class in emerging markets will create new opportunities for the travel industry, particularly in Asia markets.

Companies that embrace these trends and invest in new technologies and sustainable practices are likely to be well-positioned for success in the future.

<https://www.phocuswire.com/top-travel-industry-predictions-2023>

Economic trends in the hotel industry

With still COVID infections not totally disappeared, global conflicts, supply chain issues, and inflation the outlook could be more promising, For the hospitality industry experts the areas that will play crucial roles during 2023 are:

The rise of **Bleisure travel and digital nomads** – COVID-19 pandemic has accelerated these trends, as remote work has become more common and people seek more flexibility in their lives. Technology is the enabler and it facilitates these changes with digital tools for managing work and travel.

Virtual travel travel may not replace physical travel, but it has handful of benefits for tourism as viewers can experience activities, locations, and destinations from the comfort of their own homes. By offering virtual experiences, hotels and destinations can increase guests' anticipation and desire to visit in person.

Sustainable conscious travellers – the increasing importance of sustainable tourism and the growing number of environmentally conscious travellers who prioritize staying with brands that actively promote sustainability.

The **importance of small businesses**, such as small accommodation providers, retailers, and service providers. Small businesses bring a unique and personalized touch to travel experiences and are often popular choices for travellers attending events or festivals.

COVID as an influence on travel decisions, with travellers prioritizing destinations with low infection rates. The emphasis on growing trends towards experiential travel, with travellers seeking out opportunities to engage with the history and culture of their destination. This trend is contributing to the growing popularity of smaller hotels that offer a more personalized and authentic travel experience.

The rising trend of **wellness travel**, where people travel to improve their physical and mental health and achieve a sense of overall well-being. The trend is being driven by increasing health consciousness among travellers, aided by technology that allows them to track their health more closely. The hospitality sector has the opportunity to adapt to this trend by offering amenities, services, and facilities that cater to wellness travelers. This might include changing menus, upgrading amenities, offering classes, or renovating rooms to provide guests with the freedom of choice they desire and the ability to maintain their home routines while traveling.

Important digital and tech trends

With the increasing amount of data in the world, voice search has the potential to narrow down guest preferences and improve the guest experience. Amazon's voice assistant is being integrated into hotels, allowing guests to request services such as housekeeping or room service and control "smart" hotel room functions like adjusting the thermostat or raising the blinds. The system can also be customized to include key guest information, such as checkout time or pool hours.

Biometric technology will be used for various purposes, such as contactless check-in and security screenings. The demand for flexible check-in and check-out times from travellers, who are seeking more time-efficient and convenient experiences. Hotels can adopt technology solutions to improve the check-in/out process and provide a smoother experience for guests, proving to be more successful in attracting and retaining guests.

Seamless, contactless, and fast payment methods are evolving in the travel and hospitality industry. Integrated payment solutions can simplify the payment process and eliminate clunky hardware, enabling paperless transactions. Customers will choose the payment method that is easiest for them, and businesses that can provide quick and easy payment options are more likely to be rewarded with loyalty.

Companies have recently embraced chatbots, which are proving to be useful for providing customer service support, processing bookings, and checking guests in and out. The trend of using artificial intelligence is particularly strong in the travel industry where 24/7 support is often required. Additionally, recognition technology such as facial and fingerprint recognition is being implemented, allowing guests to enter their room or check-in/out seamlessly, providing a point of difference for hotels that adopt this technology early on.

With so many opportunities the tourism industry and developments with the adoption of digital technology, companies have been able to improve customer experience or develop their hospitality.

However, adopting innovative technologies requires experimentation, which can be costly. This is particularly challenging for SMEs, who require clear guidance on how to proceed with their digitalization efforts.

Digitalizing a tourism business is a step-by-step process that requires time and effort. Initially, tourism businesses prioritize internal operations and value creation for their customers. However, as they progressively adopt digital marketing strategies and shift towards online sales, they move closer towards complete digitalization, which involves creating 'smart' tourism experiences with innovative technologies, real-time e-commerce capabilities, and stronger connections with both customers and suppliers. Although this presents numerous possibilities, it also brings its fair share of challenges.

One of the most significant hurdles in digitalization is acquiring digital knowledge, cultivating new skills, and innovating new products. Furthermore, investing in technology can be an expensive affair, particularly in regions where infrastructure is still underdeveloped.



In the TOURBIT project the following technological approaches and application areas were identified that contribute to improving the tourism sector while responding to the opportunities in the European Tourism SMEs:

Augmented Reality (AR)
Contactless
Artificial Intelligence (AI)
Online Travel Agency (OTA) **Blockchain** Cybersecurity
Data Analytics **Internet of Things (IoT)** Platform economy
Cloud Computing
Virtual Reality (VR) **Online sales**

4. STAGES OF DIGITALIZATION

In the previous report ([Year Release of Top Technologies 2022](#)), this section has more detailed information on the top technologies, especially suitable for the SME tourism sector, based on the latest reports, news as well as literature studies. Eight technologies were considered to contribute to improving the tourism sector while responding to the opportunities in the European Tourism SMEs: Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR), Blockchain, Cloud Computing, Contactless, Cybersecurity, Data analytics, Internet of Things (IoT), Online sales, Online Travel Agency (OTA) and Platform economy.

A Webropol-questionnaire was performed through all partners, and for this report a new questionnaire was applied aiming to gather TOURBIT partners' experiences, information as well as ideas and examples of innovative solutions relating to each technology area.

For last report, 22 sector specialists were interviewed and asked to consider each technology approach from the viewpoint of SME tourism' current business and competitiveness. They were also asked to give their opinions by prioritizing technologies (from 1 to 12) according to the importance for tourism SME business nowadays, from where technologies were mapped to various stages according to the level of digitalization of the SMEs, as follows:

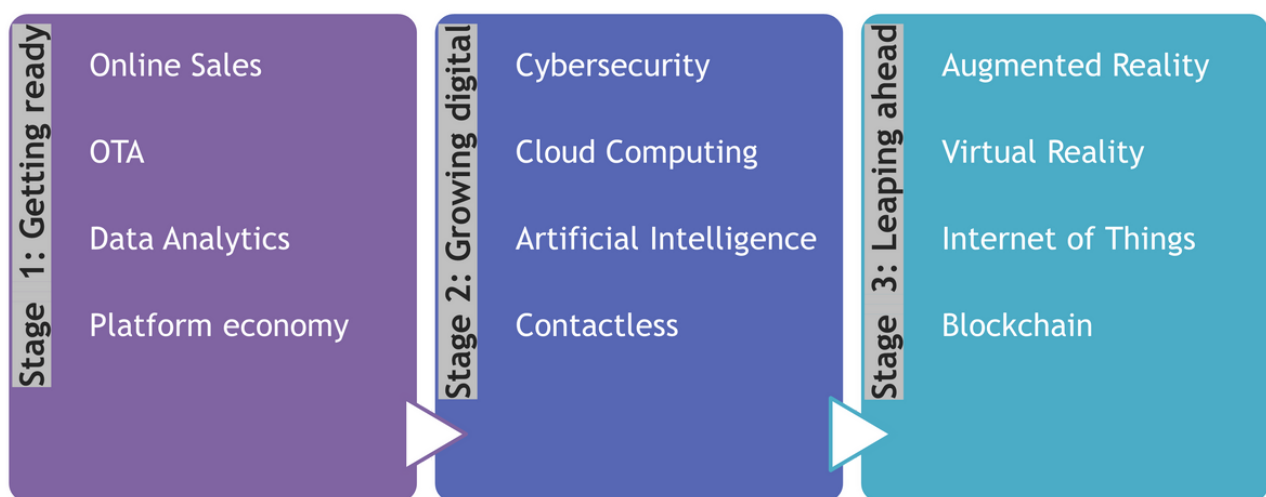


Figure 4. Stages of digitalisation paths according to the level of digitalization of the SMEs

In this report, the focus is on Stage 2, namely: cybersecurity, artificial intelligence, cloud computing and contactless.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

Embracing digital technologies can help businesses stay competitive and reach a wider audience in today's increasingly digital world. Small tourism businesses can grow their digital presence by creating a website, social media profiles, and online business listings can help small tourism businesses reach more customers.



Implementing online booking systems allows customers to easily make reservations without the need for in-person contact, which was especially important during times of social distancing and it did become a trend to stay, , while digital marketing tactics such as search engine optimization (SEO), pay-per-click (PPC) advertising, and social media advertising can help to reach a wider audience and increase visibility. Encouraging satisfied customers to leave reviews on popular review platforms can help attract new customers and build trust with potential customers.

Collecting and analyzing data on customer behaviour and preferences can help small tourism businesses make data-driven decisions to improve their services and better meet customer needs and also increase Return on Investment (ROI).on their transformation. Firstly, by focusing on customer data and using AI to generate insights that can be used to create personalized experiences for customers. Secondly, by optimizing internal processes using AI to identify inefficiencies and improve decision-making. Creating a culture of data-driven decision-making, ensures that the full potential digital transformation is realized and businesses gain a competitive advantage in the market.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

ARTIFICIAL INTELLIGENCE

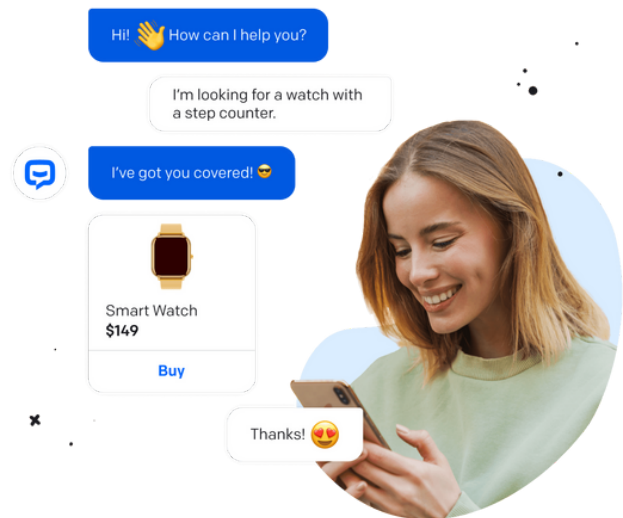
Why are Businesses Turning to Data Science & AI?

Data science was not always popular, but as companies began to generate more data than they could handle, they realized they needed to leverage it. Data science has made innovative contributions to various industries, allowing businesses to determine market opportunities, identify areas for improvement, and more. Today, data science is used in almost every industry, including gaming, to help companies become profitable.

Artificial Intelligence (AI) is computer science focused on creating machines and software that can perform tasks requiring human intelligence. It uses algorithms and statistical models to analyze and learn from data, allowing them to make predictions and decisions autonomously

Artificial intelligence and data science in the hospitality industry are here to stay. Over the years, they have impacted tourism and travel industry for the better. And now it is the hotel industry that is going to reap the benefits.

Many people take AI as a threat and fear that there are going to be job losses. However, that's not the case. AI and data science in hotels aren't stealing jobs; rather, they are making us more efficient in our jobs. The hospitality sector that has already turned to these technologies are witnessing notable changes. And with time, it is just going to get better.



TECNOLOGICAL RESPONSE

ARTIFICIAL INTELLIGENCE

Research in AI made important breakthroughs these recent years with particular break even in 2022/2023 (e.g., Chat-GPT recent release), especially in the field of generative AI that is significantly reducing costs for SMEs to use AI-based technologies. These AI technologies are now made accessible to tourism SMEs more than ever, offering new fields of possibilities. Before, important investments in HR were needed to implement advanced tech solutions, now costs are significantly reduced with simpler access.

AI helps businesses stand out, delight customers, and use resources more efficiently thanks to automation. There are many different applications that can utilize data for, e.g., providing better products or services as well as to get a better overview of predicting something or getting ready at the right time. With data can be created better transparency. Without AI, businesses risk falling behind their competitors who are already exploiting its benefits.

Now artificial intelligence is used for getting efficiency help, for example, generative AI is used for text revision or content production (openAI, quicktext).

In addition, AI is mainly being used as creating datasets for future predictive maintenance, predictive production and so on. However, more sophisticated cases utilize AI in a new context, e.g., using face authentication technology, AI is reinventing hotel check-in process. Guests no longer have to wait at the front desk or provide physical documents to check in.

This provides a seamless, contactless experience for guests, reduces wait times, and frees up staff to focus on other tasks. At the moment, the human-centric approach will still have to be more explored and considered when creating new digital innovations with artificial intelligence.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

ARTIFICIAL INTELLIGENCE

Tourism micro and SME companies can benefit from AI solutions in a various way such as:

- **Chatbots:** AI-powered chatbots can provide 24/7 customer service, answering frequently asked questions and handling simple requests, freeing up staff time to focus on more complex customer interactions. Price optimization: AI can help tourism companies optimize pricing by analyzing market trends, customer behavior, and inventory levels, and recommending the best pricing strategy to maximize revenue.
- **Personalization:** AI can help these companies tailor their offerings to the specific needs and preferences of each customer. This could involve using machine learning algorithms to analyze customer data and make recommendations for personalized tours or travel itineraries.
- **Predictive maintenance:** AI can be used to predict maintenance needs for vehicles, equipment, and facilities, reducing downtime and ensuring a better customer experience.
- **Marketing and advertising:** AI-powered tools can help these companies target the right customers with personalized marketing messages and advertisements.
- **Streamlining operations:** AI can help tourism companies streamline operations by automating routine tasks such as scheduling and booking, freeing up staff time for higher-value activities.

To take advantage of these benefits companies should start by assessing their business needs and identifying areas where AI could provide value. They can then explore existing AI solutions, or work with a vendor to develop a custom solution that meets their specific needs."

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

ARTIFICIAL INTELLIGENCE

Common industrial challenges relating to utilization of Artificial Intelligence

The main challenges of using AI in SME tourism now include limited IT expertise and resources, lack of awareness of available technologies, resistance to change, and concerns about data privacy and security. There are wide range challenges of utilizing AI technologies and also SMEs are very different.

In addition, there are geographical differences to where the challenges are focused on. For example, in southern regions of Europe, the main challenges are that they don't trust the technology: "They don't think it's worth the money. They don't understand what the business case would be, or how it could improve their business or cut their expenses, for example."

Furthermore, leadership is not focused on utilizing technology. The management of companies usually has focused on sales, on getting compliance. This means on keeping the company alive or to just expand to other markets, not so much using digital technologies in this process.

The main challenge is to guide tourism SMEs on how to make efficient use of the tool efficiently, e.g. prompt with ChatGPT. Another challenge is about giving back a place to the human factor and building the usage strategy. It is up to the SME to appropriate it. Thus, mastering the full potential of AI-based solutions is still a significant challenge for SMEs. Important investments in skills and expert services are still needed. In addition, awareness of the utilization potential of AI technologies is needed.

Data privacy is the one main obstacle. Today, people are more aware of the misuse of their personal information. Guests and hoteliers both want personal information to be kept private and secure.

Developing concrete and credible use cases is key to encouraging uptake AI-based solutions. There is a lot of buzz around some solutions such as chatGPT which can have a counterproductive effect on tourism SMEs which is still a low digitalized sector. SME companies should be shown by examples that there is a financial benefit to utilizing technology. Companies lack money and time, so by showing that you can save on them, they will listen.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

For the hospitality industry AI has proven to be a valuable tool for improving customer experiences and streamlining operations.

There are many successful cases of artificial intelligence (AI) being implemented in the hospitality industry. Some of the most notable examples are:

Marriott International has partnered with Samsung and Legrand to create IoT (Internet of Things) rooms that are equipped with voice-activated assistants and personalized settings for guests.

Hilton Hotels & Resorts has introduced a robot concierge named "Connie" that uses natural language processing to answer guests' questions and make recommendations for the tech savy generations.

The Cosmopolitan of Las Vegas uses AI-powered chatbots to handle guests' requests and provide personalized recommendations for activities and dining options.

Crown Plaza Hotel in San Francisco uses a robot to patrol the corridors and public areas for suspicious activity.

AI Commercial ready solutions



4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

CYBERSECURITY

The importance of cybersecurity for the tourism domain is high, as the services of the tourism industry combine things of interest to criminals, such as personal data and payment method data, and this data is transferred using automation across several information systems. The threats of exploiting company's data, even bank accounts or sensitive data etc. is right now very high because everything is on internet and on clouds. In addition, cybersecurity is universal. The problems are the same for all companies in the world. As soon as companies have a computer, and there are confidential data, there can be attacks that strongly penalize the company.

At the moment, the cyber security know-how in SMEs in the tourism industry is mainly relatively basic, mostly only virus protection software and instructions not to visit inappropriate Internet pages are used. Success is based more on luck than know-how or skills.

The **challenges** the travel industry faces in the world of **cybersecurity** are such:

- **Payment fraud:** Travel companies process a large number of online transactions, making them a target for payment fraud. Cybercriminals may use stolen credit card details to make fraudulent bookings or purchases.
- **Data breaches:** Travel companies collect and store a significant amount of personal data, including passport details and credit card information, making them a target for data breaches. These breaches can result in the theft of sensitive data, causing financial loss and damage to the company's reputation.
- **Ransomware attacks:** Cybercriminals may use ransomware attacks to block access to a travel company's systems and demand payment to restore access. Such attacks can cause significant disruption to business operations and result in financial loss.
- **Phishing scams:** Cybercriminals may target travel companies and their customers through phishing scams, which involve sending fake emails or messages that appear to be from a legitimate source. These scams may include links to fake websites or malware that can infect computers or steal personal information.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

CYBERSECURITY

Common industrial challenges relating to utilization of cybersecurity

The main challenge is the lack of knowledge and skills.

Responsibilities should be precisely agreed in service contracts: what is the responsibility of the service provider and what is the responsibility of the entrepreneur.

SMEs in the tourism industry are forced to buy know-how, i.e. external support (for backups, antivirus, system updates, passwords, two-step authentication), but it is not necessarily known what to buy. For example, the service platforms are global, where advertisements run through different platform providers. The ads may contain malware that gets infected if you watch, even if you accidentally open the ad.

Tackling challenges starts by increasing awareness of potential solutions and practices as well as threats, e.g., raising a lot of awareness on why this is important and what can happen and how it can hurt them. Generally, people become aware when they think they are going to be attacked or already suffered from an attack. Thus, designing training programmes and awareness raising campaigns are key to encourage the uptake of those technologies.

Main obstacles for adopting this technology are 1) ignorance; as things are not concrete and so you don't know how to approach, and 2) money; cybersecurity solutions are often quite expensive.

As a key point for adopting cybersecurity solutions was mentioned commonly raising awareness. It was recognized that tourism SMEs really need these technologies, but the truth is that at the moment they don't know how to use it, do not see advantages and they are not ready to invest in this. Thus, it's important to make them understand that they must act before it is too late. For example, in Finland the National Cyber Security Centre Finland produces and provides a lot of information such as weekly news as well as information security guides and specific instructions for private persons, organizations, companies (incl. SMEs in separate), and cybersecurity experts.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

Ten points to improve cybersecurity in the tourism companies are:

1. Identify and list information critical to the company's operations.
2. Map the company's digital operating environment and list the systems that belong to it.
3. Make sure that the data backup has been handled appropriately.
4. Install an anti-malware application and the latest software updates on the devices in use.
5. Find out the responsibilities and obligations related to the data protection and cyber security of the external services used by the company.
6. Draw up operating instructions in case of data breaches or data protection violations.
7. Enable strong passwords and disable default passwords.
8. Be prepared for the theft or loss of mobile devices.
9. Assign one person from the company to take care of the company's information and cyber security.
10. Prepare the company's risk assessment and a written risk management plan

Cybersecurity commercial ready solutions



4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

CLOUD COMPUTING

Cloud computing allows companies to access technology resources on-demand over the Internet with pay-as-you-go pricing. This model offers scalability, remote access, and cost reduction related to infrastructure, software, and IT operations. The travel industry deals with large amounts of personal data, making cloud computing an efficient way to store and evaluate information. The cloud computing model also facilitates the building of applications on similar platforms, making it easier for services and resources to be utilized and re-used across various applications. However, as the travel industry is also a hotbed for cyberattacks, precautions need to be taken into account.

Cloud computing can help the tourism industry to operate more efficiently, securely, and cost-effectively.



One key benefit is the ability to store and manage large amounts of personal data in a secure and efficient manner. This is important for the tourism industry, as it often deal with sensitive customer information, such as passport details and payment information.

Cloud computing also offers scalability and flexibility, allowing tourism companies to easily scale up or down their resources as demand fluctuates. This can be particularly useful during peak seasons, where demand for travel and hospitality services may be much higher.

Another advantage of cloud computing is remote access to services, which can allow tourism companies to operate more efficiently, with employees able to access data and applications from anywhere with an internet connection.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

CLOUD COMPUTING

Right now, all of the physical persons are using cloud computing, so also tourism SMEs understand its use and what it is for and why it is good, and so on. In fact, people are very well aware of the time saved and benefits that cloud computing actually brings to them. In addition, there are a lot of other technologies available and getting with cloud computing.

Cloud computing has the potential to revolutionize the tourism industry by enabling businesses to improve their operations and enhance customer experiences. The use of cloud computing technologies is also linked to use with AI-based technologies, e.g., cloud solutions are used to do AI even if the linking these two is complex (especially for a large volume of activity).

There are several possibilities to utilize cloud computing in tourism sector:

1. **Cloud-based reservation systems** provide a central platform for travel agents, hotels, and airlines to manage reservations and bookings. These systems can automate processes such as payment processing, itinerary management, and real-time availability updates.
2. **Data analytics tools** can help tourism companies make informed decisions by analyzing customer data, market trends, and other relevant data sources.
3. **Cloud-based customer service platforms** can help tourism companies provide a seamless customer experience by integrating customer service across multiple channels, such as email, chat, and social media. These platforms can provide a centralized hub for customer interactions, allowing companies to track customer inquiries and respond quickly to customer needs.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

Additionally, cloud computing can reduce operational costs related to infrastructure, software, and IT operations.

Overall, cloud computing can help the tourism industry to operate more efficiently, securely, and cost-effectively, allowing them to better serve their customers and remain competitive in a rapidly evolving industry.

The main cloud service models are:

- **Software as a Service (SaaS):** This model provides access to software applications through the internet. The software is hosted on a cloud provider's servers, and users can access it through a web browser or mobile app. Examples of SaaS: Google Apps, Slack, Hubspot, Microsoft Office 365, Unique, Emitwise and WorkMotion.
- **Platform as a Service (PaaS):** This model provides a platform for developers to build and deploy applications without having to manage the underlying infrastructure. The cloud provider manages the operating system, runtime environment, and other components needed for application development. Examples of PaaS: Engine Yard, Heroku and Amazon Web Services (AWS).
- **Infrastructure as a Service (IaaS):** This model provides access to computing resources such as virtual machines, storage, and networking. Users can provision and manage these resources through a web interface or an API. Examples of IaaS: OVHcloud, 1&1 Ionos, RackSpace, Fuga Cloud, CloudSigma and DigitalOcean.

Some best practices on Cloud computing for SMEs are:

- **Assess** the business requirements, such as the amount of data needed to store, the type of applications that will be running, and the available budget.
- Evaluate different cloud service providers and **compare** their offerings, features, security measures, and pricing.
- Check for **scalability** in the cloud service you choose is scalable, meaning it can accommodate business as it grows

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

- Ensure **robust security** measures are in place to protect data.
- Choose a provider that offers **reliable customer support**, as it may need assistance in case of issues or downtime.
- Before signing a **contract** its essential to **understand the terms and conditions**, including service level agreements, data ownership, and liability.

Cloud computing commercial ready solutions



4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

TECNOLOGICAL RESPONSE

CONTACTLESS



Contactless technologies are a set of technologies that allow communication and data transfer without the need for physical contact between devices. They are commonly used for payment transactions, access control, ticketing, and other applications that require secure and fast data transfer.

Some examples of contactless technologies are Near Field Communication - NFC (contactless payments with mobile phones and smart cards), QR codes, Bluetooth, Biometric authentication and voice assistants.

They can be aggregated into four main categories:

- **During pre-booking:** This includes the use of mobile apps and websites to book travel services, such as flights, accommodations, and transportation.
- **Contactless check-in:** This involves the use of digital technology to check in and access travel services without physical contact. Examples include mobile check-in, self-service kiosks, and biometric identification.
- **Contactless payments:** This includes digital payment methods, such as mobile wallets, virtual credit cards, and QR codes, that eliminate the need for cash or physical credit cards.
- **Contactless services:** This includes the use of digital technology to provide services, such as room service, housekeeping, and concierge, without physical contact. Examples include in-room tablets and mobile apps for ordering services.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

- Common industrial challenges relating to utilization of Contactless are the following:
- However, at the moment many solutions of contactless technology require very high levels of investments. That is also the main challenge: using these technologies needs investments in equipment and infrastructures, not always affordable for SMEs now. There can be the following obstacles in utilizing the technology: lack of knowledge, cultural barriers, expensive systems, need a sustainable model, and accompanying to understand the actual use, problems/threat to lose everything on a system.

Some best practices on Contactless Technologies for SMEs are:

- Identify the areas of the business where contactless technologies can be used to improve efficiency, reduce costs, and enhance customer experiences.
- Research the various contactless technologies available in the market and evaluate which ones are best suited for the business needs.
- It's recommendable to implement contactless technologies in a small area of the business first to test their effectiveness before expanding to other areas.
- Train employees on how to use contactless technologies and create awareness of the benefits they bring to the business.
- Communicate with customers about the benefits of using contactless technologies and the steps taken by the business to ensure their safety and security.
- Continuously monitor and improve: Continuously monitor the use of contactless technologies and look for ways to improve their effectiveness and efficiency. This can involve seeking feedback from customers and employees and making necessary changes to the implementation strategy.

4.1 STAGE 2 GROWING DIGITAL: BUSINESS AS USUAL IS NOT AN OPTION

The future of contactless technology appears to be very promising, as many industries have realized the benefits of such solutions, particularly in the wake of the COVID-19 pandemic. Contactless technologies are likely to continue to evolve and expand in the coming years, with more advanced features and greater convenience for users.

In the travel and hospitality industry specifically, contactless technologies are expected to become more widespread and sophisticated. This could include things like facial recognition technology for check-in and boarding, virtual concierge services using AI and chatbots, and contactless payment options for purchases and transactions. It is likely that contactless technologies will become more integrated into our daily lives, and we can expect to see more innovative solutions emerging in the future.

Contactless commercial ready solutions



5. CONCLUSION

The deliverable, D1.2. Year Release of Top Technologies 2023 has been provided by the collective effort of Tourbit partners, by sharing reports of ongoing trends and used technologies and commercial ready solutions, interviews with tech experts, doing literature studies as well as gathering information and experiences relating to a selected set of technologies. As a base has been the Deliverable D1.1.a Year 2022 release of top technologies that was the first version of top technologies utilized in the tourism sector.

SMEs in the tourism domain have utilized digital solutions in various ways but to a limited extent. Thus, in the TOURBIT project, the selected emerging technologies were mapped to three stages according to the level of digitalisation of the SMEs in the tourism domain: 1) Getting ready, 2) Growing digital, and 3) Leaping ahead, as follows:

- Stage 1 > Getting ready: The stage 1 covers technologies or application areas as follows: online sales, online travel agency (OTA), platform economy and data analytics.
- Stage 2 > Growing digital: covers technologies or application areas as follows: cloud computing, contactless, cybersecurity and artificial intelligence (AI).
- Stage 3 > Leaping ahead: covers technologies or application areas as follows: augmented reality (AR), internet of things (IoT), virtual reality (VR) and blockchain.

This deliverable, Year 2023 Release of top technologies, is focused on the second stage of technologies “Growing digital”. The first-year release in 2022 was focused on the first stage technologies even if it also introduced other stages by providing at the same time the wholeness and base of the digitalisation status in tourism SMEs.

The following one will be published in March 2024 and it will be focused on according to the third stage of digitalisation.

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