# COVID-19 AND TOURISM SECTOR IN CAREC: HARNESSING THE ROLE OF TECHNOLOGY IN PROMOTING SAFE TOURISM DESTINATIONS

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# COVID-19 and CAREC Tourism Sector: Harnessing the Role of Technology in Promoting Safe Tourism Destinations

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This paper is written by Sanjay Saxena from Total Synergy Consulting Private Limited, under the supervision of Dr. Qaisar Abbas and Dr. Ghulam Samad from the CAREC Institute, and with financial support from the Asian Development Bank.

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# Acronyms and Abbreviations

| | |
|---|---|
| 2D | two dimensional |
| 2G | second generation cellular network |
| 3D | three dimensional |
| 3G | third generation cellular network |
| 4G | fourth generation cellular network |
| AC | air conditioner |
| ADB | Asian Development Bank |
| AI | artificial intelligence |
| AIR | artificial intelligence-based robotics |
| API | application programming interface |
| AR | augmented reality |
| B2B | business to business |
| B2C | business to consumer |
| B2G | business to government |
| BLE | Bluetooth Low Energy |
| BYO | bring your own |
| CAREC | Central Asia Regional Economic Cooperation |
| CI | Central Asia Regional Economic Cooperation Institute |
| COVID-19 | coronavirus |
| DMO | destination management organization |
| DNA | deoxyribonucleic acid |
| EPZ | export processing zone |
| EU | European Union |
| GDP | gross domestic product |
| GPRS | general packet radio service |
| GPS | Global Positioning System |
| GSM | Global System for Mobile Communications |
| HD | high definition |
| HH | household |
| IaaS | infrastructure as a service |
| ICT | information and communication technology |
| IDI | ICT Development Index |
| IoT | internet of things |
| IT | information technology |
| ITU | International Telecommunication Union |
| KLM | Koninklijke Luchtvaartmaatschappij—Dutch Airline |
| LTE | long-term evolution |
| MICE | meetings, incentives, conferences, and exhibitions |
| MIS | management information system |
| MSIT | magnetic security information transformation |
| MSME | micro, small, and medium-sized enterprise |
| MST | magnetic security transmission |
| NFC | near field communication |
| NIST | National Institute of Standards and Technology |
| OTA | online travel agency |
| P2P | person to person |
| PA | public address |
| PaaS | platform as a service |
| PoE | power over ethernet |
| POS | point of sale |

| | |
|---|---|
| PPE | personal protective equipment |
| PRC | People's Republic of China |
| QR | quick response |
| RFID | radio frequency identification device |
| RPA | robotic process automation |
| SaaS | software as a service |
| SME | small and medium-sized enterprise |
| SMS | short message service |
| SOP | standard operating procedure |
| TRM | tourism relation management |
| TSA | tourism satellite accounts |
| TV | television |
| TVET | technical and vocational education and training |
| UAE | United Arab Emirates |
| UAR | urban augmented reality |
| UK | United Kingdom |
| UNWTO | United Nations World Tourism Organization |
| UPI | Unified Payments Interface |
| USA | United States of America |
| USB | universal serial bus |
| UV | ultraviolet |
| VFR | visiting friends and relatives |
| VR | virtual reality |
| WHO | World Health Organization |
| Wi-Fi | wireless fidelity |
| WTTC | World Travel and Tourism Council |
| XR | extended reality |

## Executive Summary

The COVID-19 pandemic presents an unprecedented global emergency that has had catastrophic economic consequences for the entire world. The global travel and tourism industry has been one of the most seriously impacted sectors with export revenues from tourism estimated to fall by US$910 billion to US$1.2 trillion in 2020, which could reduce global GDP by 1.5% to 2.8%. Almost 100 to 120 million direct jobs and many more indirect jobs are at serious risk. For instance, the boarding and lodging sector is highly labor-intensive and accounts for around 144 million employees worldwide. Small businesses that account for nearly 80% of global tourism are particularly vulnerable. Similarly, women, who make up more than 50% of the tourism workforce, youth, and workers in the informal economy are among the most at-risk categories. No nation will be unaffected. Destinations that are most reliant on tourism for jobs and economic growth have been the worst impacted. For instance, in some small island developing states, tourism has historically accounted for as much as 80% of exports, while in Africa, the sector represented 10% of all exports in 2019.[1]

With travel restarting in some parts of the world, restricted connectivity and weak consumer confidence, the uncertain evolution of the pandemic, and the impact of the economic crisis all pose many challenges for the tourism industry. Travelers are reluctant to travel because of the associated risk of contracting the virus, uncertainty about border shutdowns, the risk of being quarantined in a foreign destination, local availability of medical facilities, and the practicality of maintaining safe distancing in crowded tourist sites. Travelers who are willing to travel have begun to demand accountable safety travel protocols and want to ensure that their destinations are clean, safe, and comfortable to travel to and within.

In response to the pandemic, governments around the globe have responded with varying degrees of alacrity and stringency. Many examples of good practices already exist. Countries at the forefront of the tourism industry, such as Portugal, Spain, and Italy, have attempted to restart tourism activities by introducing guidelines that put tourist safety first and provide specific guidelines to manage destinations and private establishments in a responsible and coordinated manner. For instance, the Portuguese National Tourism Board has issued guidelines to build trust and certainty among tourists by issuing a 'clean and safe' seal to establishments that conform to the prescribed protocols, to ensure safety, maintenance of proper disinfection, sanitation, and hygiene, accurate social distancing measures, and so on. Many governments, including some from the Central Asia Regional Economic Cooperation (CAREC) such as Azerbaijan and Georgia, have issued similar guidelines to instill confidence and assure tourists about the cleanliness and safety of popular destinations.

Although the government bodies typically own and manage most of the major tourist sites, the sector is predominantly run by private sector players who provide various tourism-related services. The pandemic has impacted all tourism segments, including hoteliers, restaurant and café owners, travel agents and tour operators, guides and transportation service providers alike. While the tourism sector has seen a boom in the last few years and many of these players have shown good growth, the sector has long been facing some deep-rooted challenges, even before the pandemic. Some of these include lack of common marketing of destinations (within a country or a region), poor destination management and governance, limited tourism product development, safety and security issues, and inadequate innovation and adoption of technology.

Information and communication technology (ICT) has been transforming the tourism sector all over the world. On the demand side, ICT empowers visitors to identify, customize, and purchase

[1] https://www.unwto.org/tourism-and-covid-19-unprecedented-economic-impacts

tourism products and services, while on the supply side ICT is playing a critical role in the competitiveness of tourism organizations and destinations, and providing tools for developing, managing, and distributing tourism product offerings globally. Rapid innovations and enhancements in ICT capabilities, combined with a lowering of ICT costs, improvements in reliability, compatibility, and interconnectivity of devices and applications are leading to enormous improvements in quality and sophistication of the tourism industry's strategy and operations. As the trend towards more independent travel is increasing, it is leading to a higher demand for flexible, personalized options. The richness of information available has radically altered visitor behavior and considerably increased visitor expectations, a consequence of increased ICT use. Through social media (such as Facebook, Twitter, and blogs) and travel aggregator ratings and reviews, visitors now have the ability to access and share information on destination, quality of service in hotels and restaurants, and the local cultural, environmental, and social situation, all from the comfort of home or office. Therefore, access to credible, timely, and relevant information is essential for both tourists and tourism sector service providers. Owing to the pandemic, the need to reassure visitors about their safety and wellbeing has never been greater—indeed, it is now critical. Without being reasonably well assured that they would be safe at all stages during the trip, the visitor will simply not make the trip.

CAREC is a heterogeneous region, both from the point of overall development, as well as from the level of technology adoption. There are significant differences in the level of ICT infrastructure and usage between different CAREC countries. At one end of the spectrum are countries such as Georgia, Azerbaijan, and Kazakhstan, which have a reasonably well-developed basic ICT infrastructure in place (although still nowhere near the level of more developed countries such as Spain, Italy, or France); other countries such as Pakistan, Tajikistan, Turkmenistan, and Afghanistan have relatively poor ICT infrastructure. Technology implementation is possible only when all the required components of the technology ecosystem—hardware, software, maintenance, and technical support services—are present. While it is theoretically possible to 'buy' technology from anywhere in the world, business enterprises, even if they have compelling reasons to do so, do not invest in technology upgradation unless the entire supporting ecosystem is available. The good news is that countries that lag behind in ICT readiness can, given the political will, quickly 'leapfrog' directly to the most advanced technologies without going through the painful journey of transitioning from outdated and old technologies to newer ones.

Keeping this regional ICT diversity in mind, as well as the larger challenges facing the tourism sector, this report makes recommendations about the use of technology to meet both the immediate need to promote safe destinations and the long-term need to improve the overall sustainability, productivity, and growth of the sector. The pandemic also provides an opportunity to use technology not only to promote safe and hygienic destinations but also helps to tackle some of the longstanding challenges. The path to recovery can be paved by the use of technological advancements that yield several co-benefits. So, while this report is primarily focused on harnessing the role of technology in promoting safe tourism destinations, it also makes the case for using the very same technologies for their potential for helping the sector recover and renew by improving operational performance and providing tourists with a better level of service.

Technologies such as artificial intelligence (AI), internet of things (IoT), cloud computing, and virtual and augmented reality (VR and AR) can play a significant role in containing and mitigating the spread of the COVID pandemic through technologies designed for minimizing touchpoints, contact tracing, providing virtual healthcare, easing cross-border movements and helping to implement safety, sanitizing, and safe distancing norms. This report makes several recommendations that are applicable in varying degrees to all countries in the CAREC region—such as maximize contactless and digital transactions, make information ubiquitous, adopt

regional support, ensure a more immersive experience through technology, deliver personalized not standardized services, incentivize innovative solutions through an innovation fund, provide incentives for technology adoption, and facilitate air bubbles and cross-border travel; these recommendations are deliberated as start points to a more integrated recovery. The report also makes specific recommendations for each cluster of countries based upon their current level and absorptive capacity for technology implementation.

This report is divided into six chapters with the following structure and objectives:

- Chapter 1 includes the details of the project background along with a brief on the tourism sector in the CAREC region. This chapter also includes the methodology followed to carry out this research study.

- Chapter 2 identifies the current situation of technology, along with the challenges faced by the tourism sector in the CAREC region. This chapter also includes a brief overview of the Asian Development Bank's (ADB's) Tourism Strategy 2030.

- Chapter 3 includes an introduction to the leading cutting-edge technologies relevant to the tourism sector and how they can be used to not only promote safe destinations but also aid in the overall recovery of the tourism sector. The chapter also provides examples of how these technologies can be implemented by different stakeholders from the tourism sector value chain.

- Chapter 4 summarizes the safety guidelines and protocols that are being issued by governments of various CAREC as well as leading tourism countries around the world. These guidelines are based on global best practices that are being implemented by different stakeholder countries to build trust and confidence among visitors so that they feel more inclined to travel. Specific guidelines where technology can play a significant role have been identified separately and recommendations have been made on which technology can be used to promote safe tourism and how this will be implemented.

- Chapter 5 provides a summary of the online survey carried out from October to November 2020 to gauge and get a better understanding of the tourism sector stakeholders' situation, concerns, and perspectives about the current state of technology in the tourism industry and plan for the way ahead.

- Chapter 6, the final chapter, consists of the recommendations based on the triangulation of all the information collected from desk research, primary surveys, and panel discussions. The chapter makes appropriate recommendations for both policy recommendations for the CAREC country governments and practical recommendations for private sector tourism enterprises for the adoption of technology for the promotion of safe tourism destinations.

# Introduction and Study Methodology

## Chapter 1

# Chapter 1: Introduction and Study Methodology

## Project Background

1. The ongoing COVID pandemic has disrupted the tourism industry worldwide, contributing to a decline of 10.3% of global gross domestic product (GDP) from the travel and tourism industry.[2] The situation in the Central Asia Regional Economic Cooperation (CAREC) region also reflects the global trend.

2. The World Travel and Tourism Council's (WTTC's) annual research shows the tourism industry supports more than 330 million jobs worldwide—that is, one in every ten jobs is in the tourism sector. The following statistics from 2019 show the significance of the revival of the tourism industry to the recovery of the current economic impact from the COVID pandemic.

**Figure 1: Tourism sector contribution to the global economy**[3]

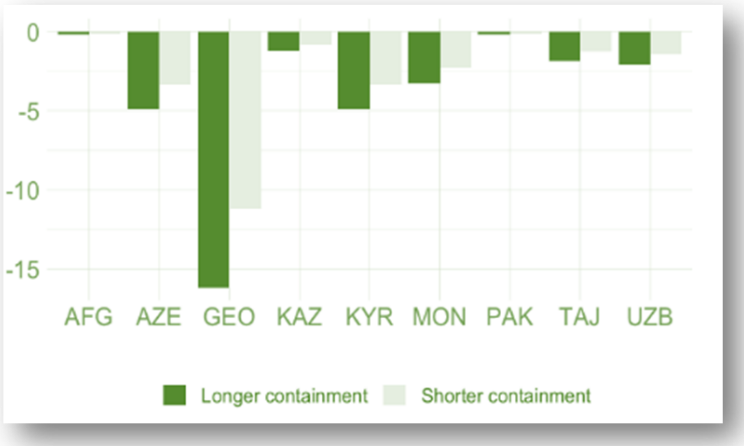
| | | |
|---|---|---|
| 2.5%<br>Contribution of the tourism industry to global GDP growth | 3.5%<br>Tourism industry GDP growth (in 2019) | 10.3%<br>Tourism industry's total contribution to global GDP |
| 330 million<br>Jobs supported by the tourism industry | 1 in 10<br>Jobs supported by the tourism industry | 1 in 4<br>of all new jobs created came from the tourism industry |

3. Since 2000, the global tourism industry has produced a direct impact of 3.9% to the world's GDP, of which 71% corresponds to domestic tourism and 29% tourism exports.[3] Tourism in the CAREC region is driven mainly by domestic tourism, followed by tourists from neighboring countries, and lastly from geographically distant markets.[4] The ongoing COVID pandemic outbreak will shift traveler priorities to closer destinations, thereby potentially making domestic and regional tourism a more sought-after alternative during the recovery period.

4. According to estimates of the United Nations World Tourism Organization (UNWTO), the overall reduction in international tourist arrivals worldwide in 2020 could range between 58% and 78%, depending on when travel restrictions are lifted. With most international and domestic flights halted and with the closure of hotels, restaurants, and travel agencies, tourism arrivals and activities are at a standstill. This shock to the tourism industry has greatly impacted business at both national and local levels, significantly affecting local economies, employment, businesses, and the industry as a whole. The pandemic has severely shaken consumer confidence and trust owing to health and safety concerns surrounding the COVID pandemic. CAREC member countries are now threatened because their economies and populations face the impact of the lockdown, which has affected tourist mobility and potentially tourist perceptions about CAREC countries and their ability to manage tourism safely.

2. Annual Economic Impact Research 2019, WTTC.
3. Annual Economic Impact Research 2019, WTTC.
4. CAREC Tourism Strategy 2030.

**Figure 2 Covid pandemic impact on international tourism receipts in CAREC in percent of GDP**




*Source :https://www.carecprogram.org/uploads/2020-COVID-Impact-CAREC-Aviation.pdf*

5. The tourism industry is a key contributor to the economy of CAREC countries, tourist arrivals in eight CAREC countries (excluding Afghanistan, the People's Republic of China, and Turkmenistan) reaching almost 20 million in 2018.[5] The share of total employment taken up by the tourism sector increased from 7% to more than 13% in Azerbaijan, and from 16% to nearly 27% in Georgia. During the same period, the contribution of the sector towards GDP also nearly doubled in both countries. The countries, however, demonstrate modest indicators; here, tourism accounted for 5.5% of GDP in 2017 employing a little over a million people, which constituted only 4.2% of total employment.

6. However, despite the enormous potential of the tourism sector in the CAREC region, there were already significant obstacles (such as consumer perceptions, accessibility, tourism products, standards and service, and personal safety) faced by the CAREC tourism industry, as identified by the scoping study conducted by the Asian Development Bank (ADB) in 2019.

7. Considering the impact of the pandemic on the tourism sector, policymakers in the region urgently need to identify and adopt mitigation strategies to minimize the impact within the CAREC region. 'There is a significant potential for new technologies to mitigate the impact of the pandemic in consumer confidence and trust, and to promote safe tourism destinations in the short to mid-term scenarios within the CAREC region' (ADB Discussion Paper).

8. To address the same, ADB has commissioned the present study to understand how it can harness the use of technology to revive the tourism sector in the CAREC region with the CAREC Institute (CI) as the nodal agency. The objective of this study is to assess 'how technology can play a key role to keep the tourism sector in swing and devising and providing policy recommendations concerning the use of technology for the promotion of safe tourism destinations at least at a pragmatic level within the CAREC region despite the effects of the COVID pandemic in the short, middle and long term.'

9. The current assignment titled *COVID-19 and CAREC Tourism Sector: Harnessing the Role of Technology in Promoting Safe Tourism Destinations* is a research project aimed at exploring

5. Since the WTTC report does not contain data for Afghanistan, Turkmenistan, and Xinjiang Uygur Autonomous Region and the Inner Mongolia Autonomous Region of PRC, the statistics have been quoted from the TOR provided for the consultants' review.

the potential for adopting technology for the promotion of safe tourism destinations in the CAREC region. The assignment focuses on the following:

- Identifying travelers' expected future needs in terms of safety and security.
- Analyzing the implications of these emerging needs in the development, management, and promotion of tourism destinations; and
- Providing recommendations on how such needs could be met through the use of technology also based on best practices from other regions and/or countries.

This study complements the *CAREC Tourism Strategy 2030* draft report, which is currently in the finalization stage, and aims to provide recommendation about the use of technology to achieve the strategic objectives of the report.

10. The following activities have been conducted as part of this study:

- Analysis of the current use of technology by individual countries and the tourism industry in addressing travelers' needs, and for promoting tourism in the respective destinations.
- Assessment and anticipation of travelers' likely future needs given the health and safety concerns arising owing to the COVID pandemic.
- Analysis of the implications of travelers' emerging needs for developing, managing, and promoting tourism destinations within the CAREC region.
- Highlighting potential policy recommendations on how to meet travelers' emerging needs via the use of technology.

11. The study aims to assess the potential for the adoption of technology to aid tourism sector stakeholders to: a) promote safe destinations; and b) recover from the devastating economic effect of the pandemic. The study does not focus on tourism sector review *per se* but on the role of technology in promoting safe destination tourism, in alignment with the broad direction as provided by ADB's strategy document.

# Study Methodology

## Study Methodology

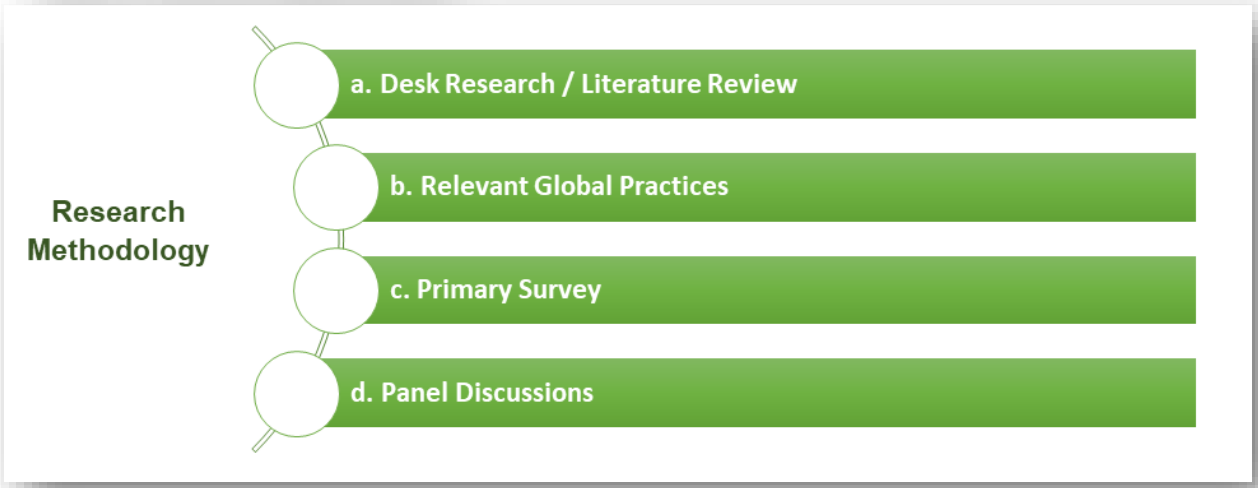
12. The study aims to assess the potential for the adoption of technology to aid the recovery of tourism sector stakeholders from the devastating economic effect of the pandemic. The study does not focus on tourism sector review *per se* but on the role that technology can play in promoting safe destination tourism. Although not mandated by the terms of reference, the study also takes a broader look at the potential of technology to solve some of the longstanding problems faced by the tourism sector, to make tourism sector entities more competitive, cost-efficient and customer focused. Simply making destinations safe, without addressing these challenges, will not allow the sector to recover or thrive in the long run. Keeping these twin objectives in mind, the following research methodology has been adopted for the study.

### Research Methodology

13. Given the travel limitations as well as the limitations imposed by being able to have only virtual meetings, the study used a combination of secondary and primary research techniques to develop a comprehensive understanding of the role of technology in the tourism sector. Further, the study used a mix of both qualitative and quantitative data for the triangulation of information gathered from multiple sources. The primary research included an online survey through a structured questionnaire and a series of focus group panel discussions with tourism sector experts. The secondary research included extensive literature review, desk research, and going through online articles, papers, blogs, and YouTube videos. This use of multiple sources of information was adapted to make recommendations that are feasible and appropriate, as well as to test the validity of the recommendations made.

14. The research methodology included:

**Figure 3: Research Methodology**




#### a. Desk research

15. **Detailed literature review on the use of technology in the tourism sector to aid recovery.** The literature review was a continuous process and was completed throughout the research study. This included various reports, white papers, and guidance notes prepared by leading international and national tourism agencies such as, but not limited to, ADB, CI, World Bank,

UNWTO, and WTTC. These reports contained an assessment of the current situation as well as ideas for the adoption of technology in the promotion of safe destinations and tourism. The second leading source of desk research were the guidelines, policy documents, and regulations issued by CAREC as well as other leading tourism countries (such as Italy, France, Spain, Australia, and Singapore.). The literature review also included going through numerous YouTube videos that included documentaries, interviews, and panel discussions with leading tourism, hospitality, and technology sector experts relevant to the study.

### b. Relevant global best practices

16. **Selection of relevant global best practices.** After the desk research, global best practices were studied from leading development agencies and countries that have been at the forefront of technology adoption in the tourism sector. Those global best practices relevant to the CAREC region were identified, considering the current status of tourism and information and communication technology (ICT) sector development. Based on the identified global best practices, guidelines for the various tourism industry segments (stakeholders) were developed. These guidelines will aid in the adoption of appropriate technologies and the development of standard operating procedures (SOPs) to be followed by these stakeholders. The documents referred to are included in the bibliography.

Figure 4: Research Methodology - Source


### c. Primary survey

17. A primary survey was planned to gain a better understanding of the situation and concerns of the tourism sector stakeholders in the CAREC countries and to gauge the potential for implementing various cutting-edge technologies in these countries. The process involved in designing and administering the survey was as follows:

18. For each category/segment of tourism stakeholder, the consultant, with the assistance of the national consultant (engaged by CI), identified representative organizations such as chambers of commerce, trade bodies, and industry associations. The online survey questionnaires were distributed to the identified representative organizations with a request to distribute them among their members.

19. **Design of primary survey forms.** Questionnaires were designed for representatives from each segment of the tourism industry using Google Forms and Qualtrics. The main objective of the structured questionnaire was to:

- Assess the current state of play for these stakeholders—what is the nature and extent of damage suffered by them?
- Determine the current usage and availability of technology in their respective segments.

- Identify potential, willingness, and constraints for technology upgradation.
- Seek out ideas or suggestions for the support needed to adapt to the technology that promotes safe and comfortable travel during the post-pandemic era.

20. **Vetting of survey forms by CI and ADB.** The questionnaires were refined based upon feedback received from ADB and CI.

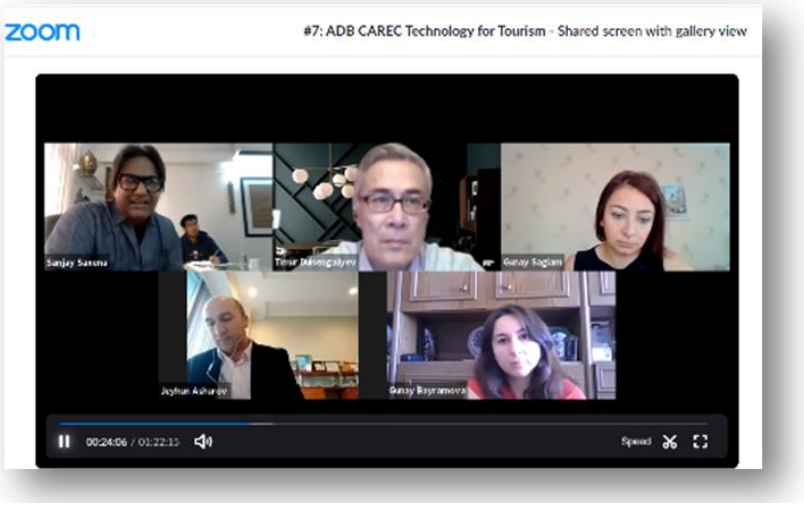
21. **Conduct a pilot survey and carry out form refinement.** A preliminary pilot survey was conducted on sample agencies and the data was compiled. Since the national consultant assisting the consultant is based in Azerbaijan, the pilot was conducted there. The main purpose of piloting was to find out which technical issues or points needed to be improved, and which questions needed to be rephrased or reframed, based upon the respondents' response. The aim of these refinements was to achieve a better quality of response to the survey.

22. **Conduct online surveys.** With support from ADB and CI, the consultant promoted the surveys widely to stakeholders of the tourism industry in the region, as well as to focal persons and respective trade bodies throughout each country. All possible attempts were made to ensure a wide distribution of the questionnaire.

### d. Panel discussions

23. A few panel discussions, expert interviews, and focus group interviews were conducted with key experts and agencies for the respective segments of the tourism sector in November 2020. Panel discussions were focused on understanding the present and expected scenario of destination tourism in CAREC countries, and gathering ideas, suggestions, and perspectives about the role that technology can play for the recovery of the tourism sector. This free interaction with industry experts helped the consultant to gather qualitative information that cannot be collected through structured questionnaires. The second set of focus group meetings were conducted during December 2020 to gather more insights from key industry experts and agencies.

**Figure 5: Focus Group Meeting**




24. **Data analysis and compilation of key findings.** All relevant information and data collected through the primary survey, as well as through consultations, panel discussions, and secondary sources, was compiled. This was followed by comprehensive data analysis to enable the consultant to make appropriate, feasible, and relevant recommendations.

## Constraints Faced During the Survey

25. Given the travel limitations imposed by the pandemic, resulting in exclusive reliance on virtual meetings and contacting potential respondents only through emails or social media, it was impossible to predict the actual number of primary survey forms that would be collected. The study promoted the questionnaires extensively through digital media to elicit a high response from the target representative bodies for each segment in all member countries. Difficulty in identifying the genuine representatives and service providers owing to the absence of a concrete national or regional database was one of the key constraints faced during the distribution process.

26. In addition, a huge number of email addresses of tourism and travel firms were collected, and more than 900 emails were sent. The survey link was also promoted through various social media platforms such as WhatsApp, Viber, WeChat, Telegram, Messenger, Facebook, LinkedIn, and Instagram, in the form of public posts and personal messages. For instance, the survey was shared through:
    - More than 900 emails and several reminder emails as a follow-up were sent to official mail IDs found on the company website of hotels, tour operators, food establishments, and so on.
    - 500 LinkedIn personal invitations were sent to tourism-related stakeholders and potential tourists.
    - 100 Facebook public posts on country-specific, tourism-related pages to reach as many target groups as possible.
    - More than 100 Messenger messages were sent to tourism service provider pages.
    - More than 200 messages were sent to individuals and 15 travel-related groups were created to distribute the questionnaire extensively via WhatsApp, Viber, WeChat, and Telegram.

27. CI's Director sent request letters to the designated national focal persons for the tourism sector in all the CAREC countries, requesting them to distribute the survey link among their networks.

28. A significant amount of effort went into promoting the survey, yet the response to the survey was not as high as expected. Although the email addresses of tourism sector firms were collected directly from individual websites of these firms, a large number of emails bounced back, indicating that even the better organized tourism sector service providers in the CAREC region make limited use of technology.

# Tourism in the CAREC region

Chapter 2

# Chapter 2: Tourism in the CAREC Region

29. CAREC is a heterogeneous region with areas and routes rich in history and culture and arresting natural endowments that traverse national boundaries. The set of capitals and important metropolitan areas in the region constitute a rich and unexplored network of cities capable of providing unique experiences catering to various tourism segments such as business, culture, nature and adventure, sun and beach holidays, and health and wellness. While individual CAREC countries possess outstanding resources for the development of their tourism sectors, their potential is at best minimally achieved. One of several reasons for this is the limited use of technology.

30. The role of technology in an increasingly interconnected and interdependent world transcends geographic boundaries, economies, and sectors. Before we look at the technologies that can be implemented in the tourism sector, it is important to first understand the level of ICT adoption in the CAREC countries to gauge what is realistically possible and feasible to implement there. Technology implementation is possible only when all the required components of the technology ecosystem—hardware, software, maintenance, and technical support services—are present. While it is theoretically possible to 'buy' technology from anywhere in the world, business enterprises, even if they have compelling reasons to do so, do not invest in technology upgrades unless the entire supporting ecosystem is available.

31. To clarify, while there are some simple technologies that cannot be grouped under ICT, such as simple thermal scanning for body temperature or automatic spray cubicles for sanitization, the most substantive and cutting-edge technologies relevant to this study are predominantly based on ICT. Therefore, while this report uses the term 'technology' in its wider scope, it focuses largely on ICT.

32. It is with this background and purpose that the following section provides: 1) A summary view of technology readiness in the CAREC countries, so that countries at similar technological advancement levels can be grouped and appropriate recommendations made accordingly for each cluster. 2) The second part of the chapter includes a summary of *CAREC Tourism Strategy 2030*, which outlines the challenges faced by the tourism sector in the CAREC region. The challenges discussed therein have provided, at least in part, the reason for this study, at a broad level, as explained in paragraph 11 of Chapter 1 of this report.

## Present Scenario of Technological Infrastructure in the CAREC Region

33. CAREC is a heterogeneous region, both from the point of overall development, as well as from the level of technology adoption. There are significant differences in the level of ICT infrastructure and usage between different CAREC countries. At one end of the spectrum, countries such as Georgia and Azerbaijan have a reasonably well-developed basic ICT infrastructure in place (although still nowhere near the level of more developed countries such as Spain, Italy, or France); at the other end of the spectrum, countries such as Tajikistan, Turkmenistan, and Afghanistan have relatively poor ICT infrastructure.

34. Keeping this regional ICT diversity, the study included a review of various ICT readiness reports and data sets available for CAREC countries from numerous sources—such as (but not limited to) the World Bank Open Database, statistics provided by individual country websites, ADB databases, and the International Telecommunication Union (ITU)—to understand the present scenario of technological infrastructure in the CAREC region. The identified indicators demonstrate the rate of current technology adoption in the respective

CAREC countries. Although there are considerable dissimilarities between the different countries in the region, technology has indeed contributed to the growth of tourism, albeit to a different extent in each country.

35. The ICT Development Index (IDI), published annually by ITU since 2009, is a composite index that until 2017 combined 11 indicators into one benchmark measure. It is one of the most common sources for data and trends in the technology sector and is used to compare and benchmark between countries and over time. The World Bank uses ITU data sets to publish ICT data on the World Bank and ITU sites are for 2018. For a more up-to-date situation, 2020 data sets from DataReportal have been used in this report.

36. As per the IDI, the technology development process and a country's evolution towards becoming a technologically advanced society are typically depicted using the three-stage model:

- **Stage 1: Technology Readiness**—reflecting the level of basic networked infrastructure and access to technologies within the country.
- **Stage 2: Technology Intensity**—reflecting the increased level of use of technologies in the society; and
- **Stage 3: Technology Impact**—reflecting the stage with tangible results/outcomes that can be witnessed owing to more efficient and effective use of technologies.

Based on the above criteria, individual ranking and IDI value of each CAREC country along with the statistical data for technology ICT infrastructure are presented in Table 1.

The technology development process and a country's evolution towards becoming a technologically advanced society are typically depicted using the three-stage model:

**Technology Readiness**
**Technology Intensity**
**Technology Impact**

**Table 1: ICT Development Index and its key indicators—2017 for CAREC countries**

| CAREC country | IDI value | IDI worldwide ranking | Percent of HHs with computer | Percent of HHs with internet |
|---|---|---|---|---|
| Afghanistan | 1.95 | 159 | 3.43 | 4.80 |
| Azerbaijan | 6.20 | 65 | 64.30 | 77.40 |
| China[6] | 5.60 | 80 | 52.50 | 55.52 |
| Georgia | 5.79 | 74 | 52.50 | 49.79 |
| Kazakhstan | 6.79 | 52 | 76.20 | 84.38 |
| Kyrgyzstan | 4.37 | 109 | 21.40 | 18.76 |
| Mongolia | 4.96 | 91 | 23.59 | 23.57 |
| Pakistan | 2.42 | 148 | 16.15 | 22.14 |
| Tajikistan | - | - | - | - |
| Turkmenistan | - | - | - | - |
| Uzbekistan | 4.90 | 95 | 43.87 | 75.40 |

*Source: https://www.itu.int/net4/ITU-D/idi/2017/index.html#idi2017rank-tab*

6. For China, the statistic for People's Republic of China is stated.

37. The IDI values based on the Technology Development Index indicate the level of network infrastructure and access to technology in the society, and the results of more efficient and effective use of technology. The 2017 IDI values range from as low as 2.42 in Pakistan and as high as 6.79 in Kazakhstan. Azerbaijan has an IDI value of 6.20 followed by Georgia at 5.79 and Mongolia at 4.96. The figure 4.37 is reported for Kyrgyzstan, 4.90 for Uzbekistan, 5.60 for China, and 1.95 for Afghanistan.

38. Table 2 provides a comparison of technology adoption of CAREC countries with some other Asian countries:

**Table 2: ICT Development Index and its key indicators—2017 for Asian countries**

| Other Asian country | IDI value | IDI worldwide ranking | Percent of HHs with computer | Percent of HHs with internet |
|---|---|---|---|---|
| *Bangladesh* | 2.53 | 247 | 9.59 | 14.50 |
| *India* | 3.03 | 134 | 15.40 | 22.64 |
| *Indonesia* | 4.73 | 111 | 19.14 | 47.22 |
| *Malaysia* | 6.38 | 63 | 72.21 | 76.86 |
| *Myanmar* | 3.0 | 135 | 13.64 | 24.38 |
| *Sri Lanka* | 3.91 | 117 | 25.37 | 21.11 |
| *Thailand* | 5.67 | 78 | 28.41 | 59.84 |
| *Vietnam* | 4.43 | 108 | 23.53 | 25.90 |

*Source: https://www.itu.int*

39. This benchmarking of CAREC countries with other Asian countries on their performance on various indicators shows that they are more or less on a par with other countries, with a few notable exceptions. The 2017 IDI values range from as low as 2.53 in Bangladesh and as high as 6.38 in Malaysia. The IDI value for India is 3.03, for Indonesia at 4.73, for Sri Lanka at 3.91, Thailand at 5.67, Vietnam at 4.43, and Myanmar at 3.0. It can be observed that the existing technology development scenario for most CAREC countries, except for Afghanistan and Pakistan, is far better than for the other major Asian countries.

40. From Table 3, internet usage by individuals generally shows a growth pattern for most countries over the years. Mongolia grew by 44.7% and Pakistan by 20% during 2018 and 2020. At 80% Azerbaijan represents the highest percentage of internet users, while Tajikistan at 26% represents the lowest.

**Table 3: Digital indicators (connections) for CAREC countries**

| *CAREC country* | *Percent of individuals using the internet. (percent of the total population)* | | | *No. of mobile connections (million)* | | *No. of mobile connections (percent of the total population)* | |
|---|---|---|---|---|---|---|---|
| | *ITU 2017* | *ITU 2018* | *Reportal 2020* | *ITU 2018* | *Reportal 2020* | *ITU 2018* | *Reportal 2020* |
| *Afghanistan* | 10.60 | 13.50 | 20.00 | | 26.92 | 90 | 70 |
| *Azerbaijan* | 78.20 | 79.80 | 80.00 | 10.34 | 17.29 | 104.00 | 112 |
| *China*[7] | 53.20 | 54.30 | 59.00 | | 1,610 | 99.90 | 112 |
| *Georgia* | 50.00 | 63.97 | 68.00 | 5.34 | 5.57 | 133.4 | 139 |
| *Kazakhstan* | 76.80 | 78.90 | 79.00 | 26.00 | 25.45 | 141.90 | 136 |
| *Kyrgyzstan* | 34.50 | 38.00 | 47.00 | 7.73 | 9.73 | 122.60 | 150 |
| *Mongolia* | 22.27 | 23.71 | 68.00 | 4.22 | 4.42 | 133.20 | 136 |
| *Pakistan* | 15.51 | 15.51 | 35.00 | 153.90 | 164.9 | 72.50 | 75 |
| *Tajikistan* | - | 21.96 | 26.00 | 9.90 | 10.04 | 111.53 | 107 |
| *Turkmenistan* | | 21.25 | 26.00 | | 4.79 | 95.76 (2017) | 80 |
| *Uzbekistan* | 46.79 | 52.31 | 55.00 | 24.26 | 25.14 | 75.90 | 76 |

*Source: Adapted from https://www.itu.int and https://datareportal.com*

41. Except for Kazakhstan—which, surprisingly, witnessed a dip of 0.55 million decrease in the number of mobile connections from 2018 to 2020 from 26 million users to 25.45 million users—all other CAREC countries saw an increase. Pakistan had the highest number of connections at 164.9 million in 2020, while Mongolia had the lowest number of connections at 4.22 million.

42. However, if instead of looking at the absolute number of connections, we consider the number of mobile connections as a percentage of the total population, the situation appears very different. For instance, Pakistan with the highest number of connections has one of the lowest percentages (35%) as opposed to Azerbaijan, which, while having a low absolute number, has 80% of its population with a mobile connection.

43. To assess the current technological infrastructure in the CAREC region, the countries are grouped into clusters, based on the rate of technology adoption in different countries. Grouping the 11 countries into three clusters enables the consultant to adopt a differentiated approach and to make feasible and appropriate recommendations for technology adoption. Such a grouping will ensure that the recommendations are in line with the respective country's capacity to adopt these technological changes while conforming to the globally accepted standards as closely as possible. It is important to acknowledge that the private sector will need to adopt the bulk of the suggested technological advancements and not the public sector. Hence, there is a critical need to make feasible and implementable recommendations.

7. For China, since statistics were not available for the region covered under the CAREC classification, the statistics for the entire country have been used in all the tables in this chapter.

**Table 4 : Digital Indicators for CAREC countries**

| Countries | ICT Indicators - Value | | | | | ICT Indicators - Rank | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As a %of Total Population | | | | | As a %of Total Population | |
| | ICT Index | %of HH's with Computer | %of HH's with Internet | Individuals using Internet | No. of Mobile Connections | ICT Index | %of HH's with Computer | %of HH's with Internet | Individuals using Internet | No. of Mobile Connections |
| | Value | ITU 2017 | ITU 2017 | Reportal 2020 | Reportal 2020 | Value | ITU 2017 | ITU 2017 | Reportal 2020 | Reportal 2020 |
| Azerbaijan | 6.2 | 64.3 | 77.4 | 80 | 112 | 2 | 2 | 2 | 1 | 5 |
| China | 5.6 | 52.5 | 55.52 | 59 | 112 | 4 | 3 | 4 | 5 | 5 |
| Georgia | 5.79 | 52.5 | 49.79 | 68 | 139 | 3 | 3 | 5 | 3 | 2 |
| Kazakhstan | 6.79 | 76.2 | 84.38 | 79 | 136 | 1 | 1 | 1 | 2 | 3 |
| Kyrgyz Republic | 4.37 | 21.4 | 18.76 | 47 | 150 | 7 | 7 | 8 | 7 | 1 |
| Mongolia | 4.96 | 23.59 | 23.57 | 68 | 136 | 5 | 6 | 6 | 3 | 3 |
| Uzbekistan | 4.9 | 43.87 | 75.4 | 55 | 76 | 6 | 5 | 3 | 6 | 9 |
| Pakistan | 2.42 | 16.15 | 22.14 | 35 | 75 | 8 | 8 | 7 | 8 | 10 |
| Tajikistan | - | - | - | 26 | 107 | - | - | - | 9 | 7 |
| Turkmenistan | - | - | - | 26 | 80 | - | - | - | 9 | 8 |
| Afghanistan | 1.95 | 3.43 | 4.8 | 20 | 70 | 9 | 9 | 9 | 11 | 11 |

*Source : Adapted from https://www.itu.int and https://datareportal.com*

44. Table 4[8] shows the key digital indicators for the CAREC countries. If we do a corrective assessment of indicators—such as ICT index, or percentage of households with a computer—three broad groupings/clusters of countries emerge:

45. **People's Republic of China, Azerbaijan, Georgia, and Kazakhstan** show similar higher trends in almost all indicators and rank among the top three countries in the region. Kazakhstan has a relatively higher percentage of households with an internet connection and computer as compared to other countries in the same cluster.

46. **Kyrgyzstan, Mongolia, and Uzbekistan** all show a similar trend of relatively lower values for different indicators, which places them in the middle category of the grouping based on the digital indicators. Uzbekistan has a relatively high percentage of households with an internet connection at 75.4%. While Mongolia and Kyrgyzstan have the highest number of mobile connections as a percentage of the total population among the countries (at 136% and 150% respectively), they rank fairly low on other indicators. Hence, looking at the overall situation, they can be considered for the middle cluster, which represents mixed growth patterns.

47. **Pakistan, Tajikistan, Turkmenistan, and Afghanistan.** Owing to the unavailability of data for Tajikistan and Turkmenistan, no values have been reported in Table 4. Afghanistan is relatively low performing across all ICT indicators among other countries.

8. Color scale adopted in all the tables is a conditional format for blending two or three colors in the background of a cell to better highlight the cell details. The background of the cell is red if the value is low, yellow if the value is in the middle, and green if the value of the cell is high.

**Table 5 : Digital Indicators (Social Media) for CAREC countries**

| | Social Media & Digital Marketting Indicators - Value | | | | Social Media & Digital Marketting Indicators - Rank | | | |
|---|---|---|---|---|---|---|---|---|
| | As a %of Total Population | | | | As a %of Total Population | | | |
| Countries | Social Media Users | Facebook users | Instagram Users | %share of Facebook Advertisement Audience* | Social Media Users | Facebook users | Instagram Users | %share of Facebook Advertisement Audience* |
| | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 |
| Azerbaijan | 37 | 16 | 29 | 20 | 6 | 3 | 3 | 4 |
| China | 72 | - | - | - | 1 | - | - | - |
| Georgia | 68 | 62.6 | 23.55 | 76 | 2 | 2 | 4 | 2 |
| Kazakhstan | 51 | 10.18 | 44.4 | 14 | 4 | 5 | 1 | 5 |
| Kyrgyz Republic | 39 | 9.42 | 32.4 | 13 | 5 | 6 | 2 | 7 |
| Mongolia | 68 | 64.6 | 12.9 | 90 | 2 | 1 | 5 | 1 |
| Uzbekistan | 9.6 | 3.31 | 6.92 | 4.4 | 8 | 8 | 6 | 8 |
| Pakistan | 17 | 15.08 | 2.92 | 22 | 7 | 4 | 8 | 3 |
| Tajikistan | 7 | 2.55 | 5.19 | 3.8 | 10 | 9 | 7 | 9 |
| Turkmenistan | 1.2 | 0.22 | 1.07 | 0.3 | 11 | 10 | 10 | 10 |
| Afghanistan | 9.4 | 8.83 | 1.17 | 14 | 9 | 7 | 9 | 5 |

*Source: Adapted from https://datareportal.com*

** **Note** : indicators in percent age of the population above 13 Years of Age*

48. The social media and marketing indicators for the CAREC countries are analyzed from Table 5. Indicators were used such as social media users, Facebook users, and percentage share of Facebook advertisement audience. The key points from the analysis are as follows:

49. **China, Azerbaijan, Georgia, and Kazakhstan** have a similar trend across most indicators. China at 72% has the highest number of social media users as a percentage of the total population, followed by Georgia at 68%, Kazakhstan at 51%, and Azerbaijan at 37%. However, the cluster shows a diverse trend for Instagram users, as Kazakhstan has the highest percentage at 44.4% while Georgia has a lower percentage at 23.55%.

50. **Kyrgyzstan, Mongolia, and Uzbekistan** show a similar trend across different indicators. Mongolia has the highest number of social media users at 68% followed by Kyrgyzstan at 39%. For the percentage share of Facebook advertisement audience, Mongolia has the highest share at 90%. Uzbekistan has performed relatively low across social media usage indicators, at 9.6%, among other countries in the cluster.

51. **Pakistan, Tajikistan, Turkmenistan, and Afghanistan** show a similar trend of relatively lower values for most indicators, as compared to other clusters. Turkmenistan has the lowest percentage of social media users at 1.2%.

**Table 6 : Digital Indicators (Financial Inclusion) for CAREC countries**

| Countries | Digital Financial Inclusion Indicators - Value<br>As a % of Total Population | | | | Digital Financial Inclusion Indicators - Rank<br>As a % of Total Population | | | |
|---|---|---|---|---|---|---|---|---|
| | Accounts with a Financial Institution | Credit Cards | mobile money/ e-wallet accounts | online payments | Accounts with a Financial Institution | Credit Cards | mobile money/ e-wallet accounts | online payments |
| | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 | Reportal 2020 |
| Azerbaijan | 29 | 5.3 | NIL | 9.4 | 9 | 5 | - | 6 |
| China | 80 | 21 | NIL | 49 | 2 | 1 | - | 1 |
| Georgia | 61 | 15 | 2.2 | 14 | 3 | 3 | 4 | 4 |
| Kazakhstan | 59 | 20 | NIL | 24 | 4 | 2 | - | 2 |
| Kyrgyz Republic | 38 | 3.6 | 3.1 | 5 | 7 | 6 | 3 | 9 |
| Mongolia | 93 | 3.2 | 22 | 17 | 1 | 7 | 1 | 3 |
| Uzbekistan | 37 | 0.6 | NIL | 7.1 | 8 | 10 | - | 8 |
| Pakistan | 18 | 1 | 6.9 | 8 | 10 | 9 | 2 | 7 |
| Tajikistan | 47 | 5.7 | NIL | 13 | 5 | 4 | - | 5 |
| Turkmenistan | 41 | 0 | NIL | 2 | 6 | 11 | - | 10 |
| Afghanistan | 15 | 1.1 | 0.9 | 0.5 | 11 | 8 | 5 | 11 |

*Source: Compiled from https://datareportal.com*

** **Note** :: All indicators in percentage of the population above 15 Years of age.*

52. The digital financial inclusion indicators for the CAREC countries are analyzed in Table 6. Indicators such as accounts with a financial institution and percentage of people with credit cards enable us to get an idea about the level of banking and potential for digital and contactless payments. The analysis of the same reveals that the same broad grouping/clusters emerge here as well:

53. **China, Azerbaijan, Georgia, and Kazakhstan** have a similar trend for most indicators. China and Kazakhstan have the highest number of credit card users at 21% and 20% respectively. China and Georgia have a higher number of accounts with a financial institution at 80% and 61% respectively, followed by Kazakhstan at 59%. Online payments are found to be highest for China and Kazakhstan.

54. **Kyrgyzstan, Mongolia, and Uzbekistan** show a similar trend for most indicators. Mongolia has the highest number of accounts with a financial institution at 93% and mobile/e-wallet accounts at 22%.

*55.* **Pakistan, Tajikistan, Turkmenistan, and Afghanistan** show a similar trend of relatively lower values among the other group/clusters, across all the verticals. For mobile/e-wallet accounts no values have been reported for Tajikistan and Turkmenistan. Tajikistan and Turkmenistan are relatively better performing on accounts with a financial institution, the percentage of the total population, at 47% and 41% respectively.

56. **Keeping the above analysis in mind, which shows countries with similar ICT levels, this study proposes to use these three clusters/groups of countries, as the basis for making recommendations in the short, medium, and long term.**

## Key Stakeholders in the Tourism Sector

57. The tourism sector involves a multitude of stakeholders—tourists on the demand side, both the public/government and private sectors on the supply side, although the exact role of each varies across countries. For our analysis, we have identified the key stakeholders of the tourism industry in each country.

58. **Travelers/tourists.** On the demand side, tourists and travelers are identified as the key stakeholders. It is of utmost importance to include them in our study as their feedback and choices can greatly influence and enhance how service providers operate. Service providers can fully incorporate their suggestions to keep up with the latest trends and provide customized services.

59. **Government/public sector authorities.** The government/public sector plays a key role in providing and maintaining the main tourist assets and provides basic infrastructure and public amenities for almost all places of tourist attraction. The ministry of tourism in respective CAREC countries functions as a nodal agency for the formulation of national policies and programs and for the coordination of activities of various central government agencies, provincial/subnational governments, and the private sector for the development and promotion of tourism in each country. The ministry and related public sector tourism agencies play a crucial role in: maintaining and improving tourism infrastructure and product development; preparing tourism development policies, strategies, and plans; laying down sector standards and guidelines; planning and strengthening tourism promotional and marketing efforts; and, above all, catalyzing private investment through a combination of incentives, programs, and matching investments in public spaces and tourism sites.

60. **Private service provider sector stakeholders.** In the tourism industry, the players who operate and promote businesses are mainly in the private sector. The private sector typically includes the following key stakeholders:

- **Accommodation services (hoteliers/Airbnb/guesthouse/heritage property).** One of the most crucial stakeholders among tourism service providers are the accommodation providers. In our analysis, hotels, guesthouses, private rooms, heritage rooms, Airbnbs, hostels, apartments, and other such providers are classified as accommodation service providers. They are one of the most significant players in the tourism industry as they invest huge capital and human resources in catering to tourists while also generating employment opportunities.

- **Food and beverage establishments.** Food and beverage service providers play a vital role in the tourism industry. Food and beverage professionals work tirelessly to intensify customer experience through their services. In our analysis, restaurants, bars, pubs, and cafes are classified as food and beverage service providers.

- **Transport services (private and public).** Transportation has been an integral part of the tourism industry; it links tourists with tourist attractions. It is commonly believed that tourism expands more when there are better transportation systems such as air transportation, railways, or roads. In our analysis, both public and private service providers are classified as transport service providers. Public transport includes railways, trams, metros, three-wheelers, and buses, while private transport services include private taxis, Uber, Ola, and other private transport providers.

- **Aviation—airlines/airports.** The aviation industry best contributes to the development and expansion of the tourism industry. Airline and airport service providers complement the

tourism industry by creating demands and making destinations globally more accessible. Aviation services provide cost and time-effective solutions at both international and domestic levels.

- **Travel and tour operators.** Tour operators play a key role in the tourism sector. Industry experts who create, promote, and sell tourism products, they negotiate with other tourism service providers, such as hotels and airlines, and provide the most feasible solution to the tourist. They act as mediators between the supply and demand sides of the tourism industry.

- **Tour guides and site managers.** Tour guides and site managers provide assistance and information on cultural, historical, and contemporary heritage to tourists. They operate at organized sightseeing events and with individual clients at educational establishments, at religious and historical sites such as museums, and at various other tourist destinations. Their services are crucial as they interact directly with tourists and can greatly influence a tourist's experience.

## Challenges Faced by the Tourism Industry in the CAREC Region

61. While COVID has hit the global tourism, hospitality, and aviation sector in an unprecedented way—never in history, not even during the two World Wars, have 100% of tourist sites all over the world been out of bounds—there may be a silver lining to this dismal situation. Even before the pandemic, the tourism sector has long been facing challenges such as the following:

    - High cost and poor air connectivity
    - Inadequate transport infrastructure
    - Time-consuming border crossing
    - Lack of common marketing
    - Limited capacity for social responsibility practices
    - Limited tourism product development
    - Language barriers
    - Growing international health risks and geopolitical conflicts
    - Shortages of skilled workers
    - Safety and security issues, and political instability
    - Economic downturns in primary source markets
    - Natural and human-created disasters.

62. The COVID pandemic has brought about an unprecedented impact on global tourism. Similarly, it has affected the entire tourism ecosystem in CAREC countries—attractions, hotels, MICE businesses, integrated resorts, travel agents, aviation, and more. Tourism is experiencing a fundamental shift in visitor/tourist expectations and industry operations.

63. The pandemic also exposed digital gaps in the tourism sector around the world. Tourism subsectors that failed to adapt to the increasingly digital business environment struggled to retain their operational effectiveness. Accelerating digitalization is therefore critical for business across the tourism industry in CAREC countries to survive and thrive in the new normal.

64. Keeping these challenges in mind, ADB has drafted *CAREC Tourism Strategy 2030*. The main takeaways from this document are discussed in the next segment of this chapter.

65. Tourism in the CAREC region is driven mainly by domestic tourism, followed by tourists from neighboring countries, and lastly from geographically distant markets. In 2019, the region generated 424 million domestic tourists, highly concentrated in Uzbekistan (29.9%) and the two provinces of the People's Republic of China (PRC)—Inner Mongolia Autonomous Region and Xinjiang Uygur Autonomous Region (53.4%).

66. In 2019, the region sent 70 million outbound tourists but only received 41 million tourists. International tourism in the region (both inbound and outbound) is highly concentrated in neighboring countries, particularly the Russian Federation. Travel motivations in the CAREC countries vary substantially between domestic tourists and tourists from neighboring countries and distant markets. Domestic tourists and tourists from neighboring countries travel mainly for business purposes and visiting friends and relatives (VFR), while foreign tourists from distant countries tend to be motivated by culture and religion, followed by nature and adventure, and then business.

67. Tourism is considered a priority sector in the strategies and plans of the CAREC countries. However, the current level of global competitiveness of their tourism sectors is quite low. Albeit CAREC countries score highly in the attractiveness of their natural and cultural assets, they present a very modest result in other critical dimensions such as transport and tourism service infrastructure.

68. As per the *CAREC Tourism Strategy 2030*, tackling these dimensions is, therefore, key to improving the overall visitation and spending levels. Strengthening the tourism value chain by improving the range and quality of tourism services and increasing the participation of local SMEs and the private sector will enable an increase in the national funding of tourism revenues.

69. The proposed vision for the CAREC tourism region is: 'A sustainable, safe, easily accessible, and well-known tourism region that provides all-year-round quality experiences to visitors, and widely shares its benefits among its communities.'

70. To achieve the vision, the following guiding principles will underpin the development of comprehensive and effective regional tourism programs, and the promotion of tourism cooperation in the region:

    a. Prioritizing quality over quantity
    b. Adapting to global trends and building resilience
    c. Reducing regional imbalances and empowering local communities
    d. Promoting multi-seasonal tourism through product diversification
    e. Adopting a phased approach for developing the CAREC tourism network.

71. *CAREC Tourism Strategy 2030* identifies five key strategic pillars with regional scope and where the implementation of regional initiatives and projects can help countries reap the socio-economic benefits of sustainable tourism development. These include:

    a. Connectivity and infrastructure,
    b. Quality and standards,
    c. Skills development,
    d. Marketing and branding, and
    e. Market intelligence.

72. Cross-cutting themes will be mainstreamed in all interventions under the five strategic pillars, including safety and security, digital technology, gender, environmental sustainability, private sector participation, and universal access to tourism services. In addition, appropriate institutional and governance arrangements need to be in place to ensure effective implementation, monitoring, and evaluation of the *CAREC Tourism Strategy 2030*.

73. *CAREC Tourism Strategy 2030* proposes a set of measures aimed at achieving the stated vision. The vision, the guiding principles, the strategy pillars, and the tourism industry challenges were all considered while making common recommendations for the CAREC region.

# Key Technologies Relevant to the Tourism Sector Recovery

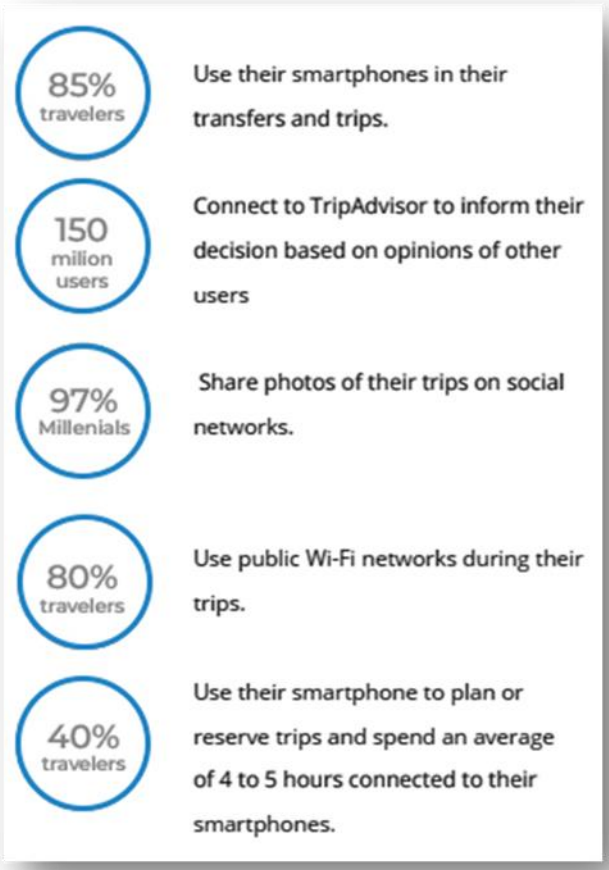
Chapter 3

# Chapter 3: Key Technologies Relevant to the Tourism Sector Recovery

## The Role of ICT in the Tourism Sector

74. ICT has been transforming the tourism sector all over the world. On the demand side, ICT empowers visitors to identify, customize, and purchase tourism products and services, while on the supply side ICT plays a critical role in the competitiveness of tourism organizations and destinations and provides tools for developing, managing, and distributing tourism product offerings globally. Rapid innovations and enhancements in ICT capabilities, combined with the lowering of ICT costs, improvements in reliability, compatibility, and interconnectivity of devices and applications are leading to enormous improvements in the quality and sophistication of the tourism industry's strategy and operations. As the trend towards more independent travel is increasing, it is leading to a higher demand for flexible, personalized options. The richness of information available has radically altered visitor behavior and considerably increased visitor expectations—a consequence of increased ICT use. Through social media (such as Facebook, Twitter, and blogs) and travel aggregator ratings and reviews, visitors now have the ability to access and share information on destination, quality of service in hotels and restaurants, and the local cultural, environmental, and social situation, all from the comfort of home or office.

**Figure 6: Global data on the Tourism Industry**




*Source: Transforming tourist destinations with artificial intelligence by @mocaplatform.com*

75. Tourism is an information-intensive industry. Visitors need information before, during, and after completing any trip. Today, time is a scarce commodity. Coupled with the fact that for most visitors their trip—either for business or leisure—represents a major investment, both financially and emotionally, means that the cost of something going wrong is very high. Therefore, access to credible, timely, and relevant information is essential to help them make an appropriate choice. Visitors can acquire information from a wide variety of sources, including directly from the tourism service providers or past visitors. Some, because of the time pressure mentioned earlier, choose to use the services of an intermediary such as a travel agent. It may be noted that, as in any other industry, the greater the degree of perceived risk in a pre-purchase transaction, the greater the consumer

propensity to seek information about the product. The current Corona pandemic has hugely increased both the risk and the costs associated with this risk of traveling, especially if the visitor becomes infected with the virus and/or falls sick.

**Figure 7: Digital information generation and consumption in the Tourism Industry**


76. Similarly, looked at from the supply side, individual tourism products are hugely diverse, and in many cases, it is this heterogeneity that makes them attractive in the first place. The endless combinations and permutations of alternative travel routes, transportation modes, boarding, and lodging options pose significant challenges for tourism service providers. Suppliers face herculean challenges in trying to win and retain customers covering the whole spectrum of incomes, interests, knowledge, sophistication, and needs. Even the simplest trip means trying to match the expectations of diverse visitors to the bewildering array of choices and options provided by millions of tourism suppliers, each trying to differentiate themselves from their competitors.

77. Yet, despite this background, at least until the outbreak of the COVID pandemic, billions of trips were made every year, proving that communication of credible, up-to-date, and relevant information is vital for the efficient operation of the tourism industry. The travel agent is expected to act as both a search-and-book service and a reliable advisor for visitors, reducing for them the cost and effort burden of searching for suitable products, and using their local knowledge and expertise to help match visitors with travel experiences. Typically tour operators and some government tourism organizations—such as destination management organizations (DMOs)—act as effective intermediaries and consolidators, packaging different travel components together and marketing them as a single seamless product.

78. According to UNWTO 'The crisis is an opportunity to rethink how tourism interacts with our societies, other economic sectors and our natural resources and ecosystems; to measure and manage it better; to ensure a fair distribution of its benefits and to advance the transition towards a carbon-neutral and resilient tourism economy.'

79. It is against this background that the role of innovative ICT cannot be overemphasized. The need to reassure visitors about their safety and wellbeing has never been greater, indeed critical, as now, owing to the pandemic. Without being reasonably well assured that they would be safe at all stages during the trip, visitors will simply not make the trip.

80. This chapter includes four main sections. The first summarizes how stakeholders from each tourism sector could potentially use technology in a transformational manner. The second highlights the challenges faced by these stakeholders in implementing technology. The third provides an overview of the latest cutting-edge technologies and how they can be deployed by sector stakeholders. The fourth provides a summary of how these technologies can be used to promote safe and clean tourism.

81. This section summarizes how tourism sector stakeholders could potentially use technology in a transformational manner:

- **Travelers/tourists.** Travelers and tourists represent the demand side of the tourism industry. Technology is employed at various stages of a tourism experience for the traveler. From online booking to navigation and online payments, technology has become an essential tool for safe destination tourism. In the current scenario, given the COVID pandemic and its impact on the tourism industry, the role of technology becomes even more relevant and is vital for a better stressless experience.

- **Accommodation services (hoteliers/Airbnb/guesthouse/heritage property).** In many ways, accommodation services, especially in more developed countries, are leading the charge in the adoption of technology to promote safe tourism destinations. Online booking and payments, contactless check-in/check-out, keyless room entry, touchless digital menu system for restaurants, virtual control electronic equipment in the room, and mobile applications for social distance technology in pool and beach areas are a few of the state-of-the-art technological measures that are already being used to promote safe and hygienic tourism in accommodation services. Safe services such as contactless infrastructure, smart TV, and smart room digital systems are a few of the rapid COVID pandemic-driven technological innovations that can be readily adopted by the CAREC countries and lead the tourism industry into recovery.

- **Food and beverage establishment.** For both domestic and international tourists, the restaurants and the food service industry are critical parts of the tourism value chain. Restaurants, cafes, bars, pubs, food courts, and similar food and drink establishments are expected to maintain a high level of cleanliness and hygiene. The food service industry needs to adopt heightened sanitary and hygiene measures to meet customer expectations and build customer trust and confidence. This can be greatly assisted through the use of automation and technology. Relevant technologies can assist in minimizing contact in all areas of operation. For instance, contactless ordering and payments can be ensured in restaurants by allowing customers to 'bring your own' (commonly referred to as BYO) device to scan QR code and order from the menu and then pick up the order in disposable packaging, for dining at the restaurant or take away. These technologies enable the outlets to promote social distancing and allow remote ordering and delivery for a safe and hygienic environment.

- **Transport services (private and public).** Transportation services are important stakeholders for the tourism value chain. The use of mobile apps and digital platforms has been increasing rapidly, and travelers are increasingly using the internet to find, book, and review travel and tourism options on the go. Technological advancement has essentially pushed the entire travel booking experience into a real-time mode. Technological hygiene measures are more prevalent as travel companies and customers are communicating and engaging with the service at the same moment. Multiple social media and online platforms can be used for tour and travel bookings, digital marketing, content, and knowledge sharing about tourist sites. The transportation sector has already advanced in terms of using GPS and radio technology to locate and call for taxis, track the route, and estimate the likely bill amount. Contactless credit card machines inside taxis or online payments further reduce direct contact and minimize the risk of viral transmission. Online purchase of air, rail, and bus tickets has already been replacing the need to queue at crowded ticket counters.

- **Aviation—airlines/airports.** The aviation industry is investing heavily in smart technology such as the internet of things (IoT), cloud computing, artificial intelligence (AI), and blockchain technology to improve the safety, efficiency, and security of passengers. Several of the latest

technologies—such as biometrics, smart check-in, baggage tracking, and connectivity—are already present in most modern airports. These improve the passenger experience, reduce queuing, ensure safe travel, and reduce hassles during check-in and immigration control. For contactless travel experience inside airports, crowd control and safe distancing norms can be implemented through common safety regulations and monitored through the latest AI and sensor-based technologies in all areas of the airport—terminal buildings, check-in check-out area, security and screening, baggage claim area, and so on.

- **Travel and tour operators.** The tour operator service is an integral part of the travel and tourism industry. Tour operators need to ensure safety and re-establish their reputation among their facility users. Online booking and payments, use of virtual tours and simulation, web-based online walks, and 3D game-based virtual historic tours are some of the trending and replicable technological innovations worldwide.

- **Tourist guides and site managers:** Tourist guides and site managers are important stakeholders of the tourism value chain. Owing to the pandemic, one of the hardest-hit professionals in the value chain is the tourist guide service provider. Other than the physical preventive measures in place—no surfaces contact, keeping a safe distance, wearing a mask, washing hands frequently, and so on—the tourist site managers can implement technologies for online booking and ticketing, tourist guides can supplement and enrich their virtual tours through simulation, web-based online walks, and so on. Properly disinfected or single-use tablets/headsets/whispers/radio guides can also be employed. With such technological advancement adopted by the tour operators, the tourist can not only enjoy a safe, hygienic, stress-free tour but also have a more entertaining experience.

## Challenges for Technology Adoption in the Tourism Sector in the CAREC Region

82. While COVID has hit the global tourism, hospitality and aviation sector in an unprecedented way—never before in history, not even during the two World Wars, have 100% of tourist sites all over the world been out of bounds—there may be a silver lining to this dismal situation. Even before the pandemic, the tourism sector has long been facing challenges as identified in chapter 2.

83. As per the panel discussions, survey findings, and secondary research, the tourism industry is keen to adopt new technologies. Some of the key challenges for the adoption of technology faced by the a) public sector b) private service providers of the tourism industry are as follows:

**a) Public sector**

- **Multiplicity of agencies.** Conflicting interests, priorities, and a lack of coordination pose challenges to the adoption of a common protocol. Centralized management and administration will be crucial for the development and adoption of technology in the tourism industry.
- **Limited innovation.** Owing to the existing limited innovation in the tourism sector, the adoption of technology becomes even more difficult. Innovation is crucial for the overall development and growth of the tourism industry.
- **Limited budgetary support.** The smooth adoption of technology requires backing by adequate financial resources and budgetary support.
- **Limited awareness about ICT.** Awareness about the latest technologies, their role, and contribution to the tourism industry is still limited.

- **Technological skill gap.** The gap between the ever-increasing technological innovations and the skills needed to maintain and optimize the advancement to these innovations impose a challenge to the adoption of technology in the tourism industry.
- **Balance regulation with incentives.** Various regulations imposed by the authorities need to be backed by adequate financial incentives. It is thus important to strike a balance between regulations and incentives.
- **Other bigger priorities.** There are various pre-existing challenges faced by the tourism industry. A smooth adoption of technology will help in addressing these challenges while catering to other priorities.

**b) Private service providers**

- **Limited internet connectivity.** One of the major challenges to the adoption of technology in the CAREC region is the underdeveloped ICT infrastructure. Further, these countries need to strengthen ICT infrastructure to support bandwidth and connectivity.
- **Lack of local support for ICT.** Local ICT awareness of tourism service providers is not on a par with required levels. With the ongoing COVID pandemic situation, there is an increasing demand imposed by tourists and relevance for the same.
- **Rapidly evolving technology.** Each generation of technology improves over the last; the rate of progress from version to version is faster than its production and implementation rate. It is important to keep track of the rapidly evolving technologies and employ them to achieve higher efficiency.
- **Limited awareness about the latest ICT.** Awareness is still limited about the latest technologies and their roles that are specific to the tourism industry.
- **Technological skill gaps.** The gap between the ever-increasing technological innovations and the skills needed to maintain and optimize the advancement poses challenges to the adoption of technology in the tourism industry.
- **Data safety and privacy concern.** The technological development that is shaped by tourism-related data results in emerging privacy issues. This calls for comprehensive yet context-specific research to ensure the data privacy of tourists.
- **High customer expectations.** Customer expectations remain considerably higher and it directly affects the level of competition between the private service providers.

84. The pandemic has created a sense of urgency and provided an opportunity to bring about a major transformation of the tourism sector and usher in much-needed reforms and implement changes to improve the operational efficiency, productivity, profitability, and above all sustainability of the sector. Governments in the CAREC regions and public sector tourism bodies can use this opportunity to bring new policies and regulations, as well as to provide the much-needed incentives to grow and upgrade the sector.

85. By adopting technology across the different function of IT operations, tourism service providers can not only improve standards of safety and hygiene, but also use technology as a driver for achieving operational efficiency and increasing staff productivity. Accordingly, the study makes two sets of recommendations aimed at governments and at private service providers of the tourism sector.

## Key Technologies Relevant to the Tourism Sector Recovery

86. The previous segment gives an overview of the role of technology in the tourism industry and its role for key stakeholders in the tourism sector and also gives a brief about the challenges faced.

87. The tourism industry is currently facing two sets of issues:
    - Visitors are not willing to be exposed to the risk of contracting the infection during travel. Their major concern is uncertainty associated with being quarantined in a foreign country and the possibility of being refused access to basic services and transport facilities. Technology can play a major role in reducing this risk by making destinations safe and clean. This will help to rebuild tourist confidence.
    - Although the emphasis on promoting safety is a pressing concern, addressing only this may not be enough to revive the tourism industry. Despite all these implementations, business prosperity levels will take several years to return to pre-pandemic levels (2019). In the larger context, there is a universally acknowledged shortfall in business revenue. Most tourism professionals consider that for the tourism sector to survive and thrive they need to reduce their costs and improve capacity and efficiency.

88. To conclude, there are two key areas in which technology can aid the recovery of the tourism industry. The first area is to improve the safety and hygiene standards of the destination to restore tourist confidence. The second area is to improve efficiency to help businesses bounce back. Just restoring tourist trust may not compensate for the loss in revenue incurred by the stakeholder owing to the imposed restrictions. Businesses will not be able to survive unless they become more productive and profitable.

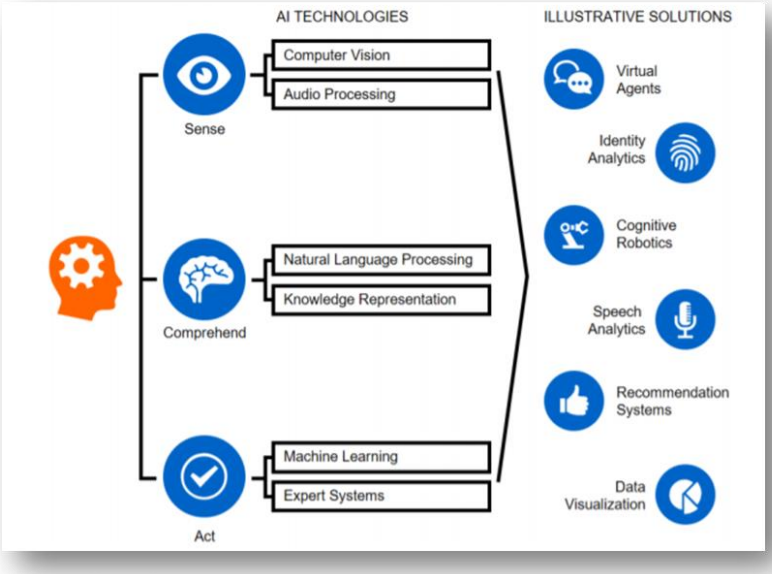
## Innovative Technologies Transforming the Tourism Industry

89. The following section provides an overview of some of the leading technologies that are transforming the tourism sector and have the potential to transform it further. These technologies, while facilitating a safe and clean destination for the tourist, also cater to the larger purpose of improving the overall efficiency, productivity, and sustainability of the service provider's business. A review of these technologies and their specific role in improving the functioning of the tourism service provider is mentioned below:
    - AI in tourism
    - Biometrics in the travel and tourism industry
    - Cloud computing
    - IoT
    - Big data and business analytics
    - Geofencing technology
    - Robotics
    - ER
    - QR technology

90. Today's digital world is hyperconnected in multiple-platform mode; the traveler seeks information online and validates it with other users looking for more virtually available content. AI plays an important role as a driver in understanding, comparing, and assimilating digitally generated content from multiple platforms. AI is the technology that appears to imitate human performance typically by learning, coming to its conclusions, appearing to understand complex content, and engaging in natural dialogs with people.

91. AI is the science of getting machines to think and make decisions like human beings. The term 'artificial intelligence' refers to the property of a machine to mimic human cognition. This includes some of the things we associate with our minds, such as learning and problem solving, that can be done by machines, although not in the same way as we do. It can also be defined as the technology that tries to make machines 'smart.'

**Figure 8 : Emerging Artificial Intelligence Technologies**




*Source :Accenture*

92. Two terms, in particular, are important in understanding AI: machine learning, which is a subset of AI, and deep learning, which is a subset of machine learning. The intelligence level of an AI system can be categorized based on:

    1) Scope of ability to reach a goal; and
    2) Fulfillment of those abilities to reach a goal, both compared to the human level of intelligence.

### Use of Artificial Intelligence in the Tourism Industry

93. A few important elements of AI have been established throughout the past half-century that can be useful in the tourism industry: the ability to perceive, understand, learn, and resolve problems.

94. In the tourism industry, AI is a technological tool that would enable travel intermediaries to convey the emotion of a travel experience during the journey. AI includes machines and systems that approximate, imitate, reproduce, and automate human thinking and ultimately expand human thinking. According to a study by the McKinsey Global Institute, the overall AI adoption level in the travel and tourism industry is relatively low. However, the industry plans to increase AI-related spending in the coming years.

95. Various technological tools within the domain of AI are developed and can be employed in the tourism industry. AI as a combination of other technologies has found groundbreaking solutions

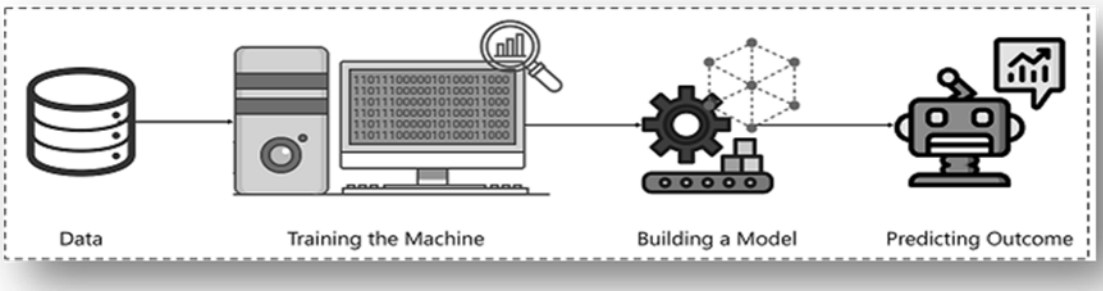
for the tourism industry. The current use of AI in the industry can be found in combination with the following technologies and fields:

- Computer vision technology
- Biometrics and facial recognition
- Robotics and voice recognition
- Natural multi-language processing
- Artificial neural nets data mining and knowledge management
- Mobility of information to knowledge
- User decision modeling and usage analysis
- Location-based services and context-aware systems
- Travel information search and retrieval
- Social networking, social media, and social inspiration, innovation and service design

96. **Chatbots** are the most commonly used implementation of AI in the tourism industry. To provide additional information about services and deal with customer queries, tourism service providers often provide customers with an email/phone number or a delegated person to contact. To bring down the costs of such communication and reduce human interaction, given the backdrop of the COVID pandemic, service providers can develop a chatbot. A chatbot is a software application used to conduct an online chat conversation via text or text-to-speech through messaging applications, websites, mobile apps, or by telephone.

97. The working of a chatbot can be described in four stages. The input data for a chatbot would be text/voice entries by customers. The AI system then identifies and processes the input, predicts, and accordingly recommends the best-suited answer. Chatbots can be the key to minimizing human contact and achieving a better customer experience with minimum interaction. A chatbot can be employed by stakeholders at multiple stages of the tourism experience.

**Figure 9 : Artificial Intelligence Algorithm - Chatbot**




*Source: Artificial Intelligence Algorithms – Edureka*

98. **AI concierge services/smart speaker.** Given the latest development in the AI technology sector, smart speakers are one of the most user-friendly and compelling products. Alexa by Amazon Go or Siri by Apple are examples, which let the user have any information, listen to music, or perform complex functions such as calling/messaging or setting an alarm, all at the ease of a command. Smart speakers employ a combination of AI, speech recognition sensors, and speakers to function.

99. **Predictive demand and capacity planning.** AI can facilitate in enabling an early prediction of the demand for a particular product or service, both in terms of quantitative and rising interests in a particular product or service. This feature can help in early planning and capacity building.

As the tourism industry is relatively seasonal, predictive analysis facilitates planning and forecasting for any unexpected scenarios of overcrowding.

100. **Back office and automation and revenue accounting.** Robotic process automation (RPA) can be a tool to automate back-office operations and cut down on additional costs. For instance, a combination of AI and machine learning can automate the categorization of invoices.

101. Relevant AI tools for the service provider sector in the tourism industry:

| | |
|---|---|
| **Tourists/ Travelers** | Tourists use AI-enabled applications in five different ways in a destination: 1) to identify tailor-made services according to the traveler's profile (business, leisure, and so on), 2) chatbot assistance for quick assessment and communication of information 3) to get a personalized intra-travel offer in real time based on his/her travel profile 4) to access safety alerts and complaints in the geolocation through chatbots 5) to look for available transport and healthcare options depending on the traveler's socio-economic profile and preferences.[9]<br><br>The Georgia Tourism Board under the campaign 'Emotions are Georgia' has developed AI that detects genuine human emotions in the social media posts of more than 7 million travelers. These posts were then used to create the printed and interactive digital versions of an emotional and accurate guidebook of the country.<br>*https://www.prnewswire.com/news/georgian-national-tourism-administration/* |
| **Accommodation service providers** | Accommodation services can use AI and its allied services in more than one way. A chatbot can be used as a tool at the point of check-in. Room service, recreational services, and common public area services at the accommodation can employ chatbots to aid customers. A customizable smart speaker can be installed in each room. The smart speaker will act as a single-command personal assistant for the guest and facilitate all the functions, such as calling room service or scheduling an alarm.<br><br>Hotels often receive more guests during the peak season; predictive analysis can help in forecasting and preparing to cater to the demand by, for instance, arranging for necessary beddings or other amenities provided by the hotel. A combination of AI and biometric technology can facilitate a contactless check-in via facial recognition. |

9. Casestudy—Mallorca—hubspot.net

The Matra resort in Hungary employed chatbots to revamp the hospitality sector. With the help of AI technology, the ten most frequently asked chatbot questions at the mantra resort were identified.

| | | |
|---|---|---|
| 1. | where is the guesthouse located | 53 times |
| 2. | how can I get there | 50 times |
| 3. | what are the available programmes | 32 times |
| 4. | what can I do there | 30 times |
| 5. | what is the name of the street | 29 times |
| 6. | what is name of the guesthouse | 25 times |
| 7. | how many people can go | 12 times |
| 8. | are there any neighbours | 11 times |
| 9. | what time should we arrive | 10 times |
| 10. | where can we eat | 9times |

90% of the questions asked via chatbots were for practical information that can be found on the website or information that can be obtained with a simple google search. Some questions such as 'how to get there' are answered with a multiple option description on accessibility.
*How does AI affect the tourism industry? Martin Zsarnoczky*

**Food and beverage establishments**

Food and beverage establishments can use a chatbot to provide customer assistance and support. Restaurants can use a chatbot for guests to make reservations and bookings before their arrival. Food and beverage service providers can use predictive analysis to forecast demand, adjust peak time pricing, and arrange other things such as increasing seating capacity and arranging crockery and other raw materials.

**Aviation service providers**

AI is already operational and highly employed in the aviation industry. Airline service providers can use a chatbot for customer assistance/providing information such as flight details, for information about restrictions owing to COVID pandemic precautions, as well as conducting preliminary scanning of passengers. Airline tickets have highly elastic prices and change according to demand and other factors. Service providers can use a combination of business analytics, analytics, and predictive analysis to maximize profits by adjusting prices.

The popularity of Facebook Messenger chatbots (which are connected with other deep text analyzing systems of Facebook) is growing rapidly among the customer service centers of state-of-the art airline companies (Alaska Airlines, Lufthansa Group, KLM, AeroMéxico) and travel agencies (Neckermann, TSI).
*How does AI affect the tourism industry? Martin Zsarnoczky*

**Transport services sector**

Transport service providers can employ predictive analysis to manage tourists during rush hours and operate effortlessly. Judging the number of passengers expected at a certain period helps in managing their services efficiently.

**Figure 10 : Facial Recognition**

Georgia has successfully completed testing of biometric facial recognition from Riddletag in the Tbilisi subway system, to use the technology in its public transport system. This is expected to provide the option of purchasing a ticket and passing through the turnstile in less than a second with facial biometrics in partnership with private banks. Tourists can download the bank's free app and register their facial biometrics within a minute. AI technology with image pre-processing developed by Riddletag detects a face within 50 milliseconds and scans the tourist's face with a 3D camera.
*https://riddletag.com/en/*

Community-based services such as the taxi service provider mobile application Uber continue to prosper simply because consumers use them, thus supporting the reform of innovative economic systems. They operate deeply embedded in social response and review, which helps them to map their customers and provide them with tailor-made up-to-date offers.

## Tour operators

Tour operators can make efficient use of AI in their day-to-day operations. Service providers can employ chatbots to handle customer bookings and queries. This will help to reduce human interaction and some additional costs.

Travel site Skyscanner has planned to offer a travel-booking service that can be done through Amazon's Alexa and Facebook Messenger. According to Booking.com, their AI-powered chatbot can respond to 30% of customers' state-related questions automatically in less than five minutes.
*https://www.chatbotguide.org/skyscanner-chatbot*

**Figure 11 : Visualize historical and real-time data using AI**


MOCA is used in Mallorca, Spain, to process, analyze, and visualize historical and real-time data on urban mobility using Wi-Fi access points. This helped to improve mobility services, which in turn helped to promote the sustainable and intelligent development of tourist destinations. This then led to reduced public spending on the management of physical and digital infrastructure.
*Case study - Mallorca - hubspot.net*

Hence, AI technology will help to enhance the services and achieve the operational efficiency of tourism stakeholders.

## Biometrics

102. At every step in a tourist's journey, there are various points where the authentication of the tourist's identity is necessary, such as check-in check-outs at airports, hotels, and restaurants. Given the current pandemic scenario, all of these physical touchpoints can now be made contactless via biometric technology. Biometric technology can be defined as a tool to identify and authenticate a person based on certain characteristics of their biology. The most prevalent options are fingerprint mapping, facial recognition, and retina scans.

103. Biometric technology can be classified into three subcategories: biological, behavioral, and morphological. Morphological biometrics include characteristics such as fingerprints or facial recognition. Biological biometrics use traits at a genetic and molecular level; these may include features such as DNA or blood. Behavioral biometrics include characteristics such as handwriting or speed of typing.

104. Advanced biometrics are used to protect sensitive documents and valuables; they have already been incorporated in e-passports throughout the world. In India, the national identification document—the Aadhaar card—captures and records the name, photo, address, and biometric input data, namely fingerprint and iris. It is used as a common identity across the country for all citizens.

105. Biometrics technology largely uses three steps that are common across all systems:

| | | |
|---|---|---|
| 1 | **Enrollment:** | The first stage involves recording the data entered into the biometric system. |
| 2 | **Data storage:** | The next stage is the storage of the data. The raw data is analyzed and designed into codes based on the characteristics of the data. |
| 3 | **Comparison**: | The third stage involves the identification of the registered code within the existing data and then accepting/declining the access accordingly. |

106. All biometrics uses three components that are common across all types of system: a sensor to identify the characteristics for identification, a computer that reads and stores the information, and software that analyzes the characteristic and turns it into code.

107. **Use of biometrics in the tourism sector**

| | |
|---|---|
| **Accommodation service providers** | Biometrics is employed and widely used by tourism service providers for identification and security purposes. A tourist can self-check-in into the hotel, rooms, elevators, and other facilities provided by the accommodation service with a biometric face scan. This parallel entry during check-in can help in giving or denying access to other paid accommodation services. |
| **Food and beverage establishments** | Food and beverage service providers can allow visitors to have contactless access to their reservations with the help of a biometric face scan. |
| **Aviation service providers** | Airports and airlines employ biometric scanners to provide a contactless check-in and immigration service. For instance, Singapore Airports, even before the COVID pandemic, provided contactless immigration through facial recognition for all passengers with passport numbers starting with K. |

| | | |
|---|---|---|
| **Transport service providers** | A biometric bag drop, passenger screening, and boarding will reduce the number of friction points at the airport. This will also reduce the interactions between passengers and crew members and ensure that safety measures are in place.<br><br>Recently, biometric technology is also being employed to ensure COVID pandemic precautions are in place. French airports have employed a facial recognition tool to identify people who are not wearing a mask.[10] | Beijing Capital International Airport has partnered with Swiss tech company SITA to automate the entire passenger journey using biometric technologies. From the airport check-in and bag drop to security clearance and final boarding, passengers can just walk through the designated lanes equipped with facial recognition systems.<br><br>*https://www.sita.aero/- SITA Smart Path transforms the passenger experience at (BCIA)* |
| | The French government, with the help of DatakaLab, is integrating new AI tools into security cameras in the Paris Métro system to check whether passengers are wearing face masks. The technology trial was to collect statistical data and was not used to identify and punish individuals.[11] | |
| | Transport services can employ biometric scanners along with digital payments instead of paper tickets to allow passengers to have minimum contact with crew members and facilitate a contactless travel experience. | |

108. Service providers need to comply with safety norms while using biometric technology.

1. Service providers must ensure that the data stored is in encrypted codes and not actual pictures of the customer's face.
2. The data should not be saved on the cloud, as it may be exploited by third-party users.
3. Service providers must clearly state the use of the data recorded.

### A combination of AI and biometric facial recognition

109. Facial recognition and AI technology can be employed not only for identification and security but also for recording an emotional response/feedback. This can help in providing a customized experience for specific services such as a spa or other recreational services.

110. According to WTTC, employing biometrics will incorporate confidence in the obtained traveler's identity information and reduce the risk associated with each traveler. A biometric scan serves as an additional layer of security as compared to paper documents. Hence, using biometrics technology will greatly enhance service provider operations and customer satisfaction.

10. https://www.sita.aero/- SITA Smart Path transforms the passenger experience at (BCIA)
11. French startup DatakaLab, which created the program, says the goal is not to identify or punish individuals who do not wear masks, but to generate anonymous statistical data that will help authorities anticipate future outbreaks of COVID-19.

111. Biometrics technology plays a crucial role in verifying personal identities by providing users with access controls without any physical contact with the security infrastructure.

## Cloud Computing

112. Given the various stakeholders involved in a tourist's journey, there are layers of data and information entailed. It is necessary to have ease of access to information at all times for both tourists and service providers, while also ensuring the safety and security of the data.

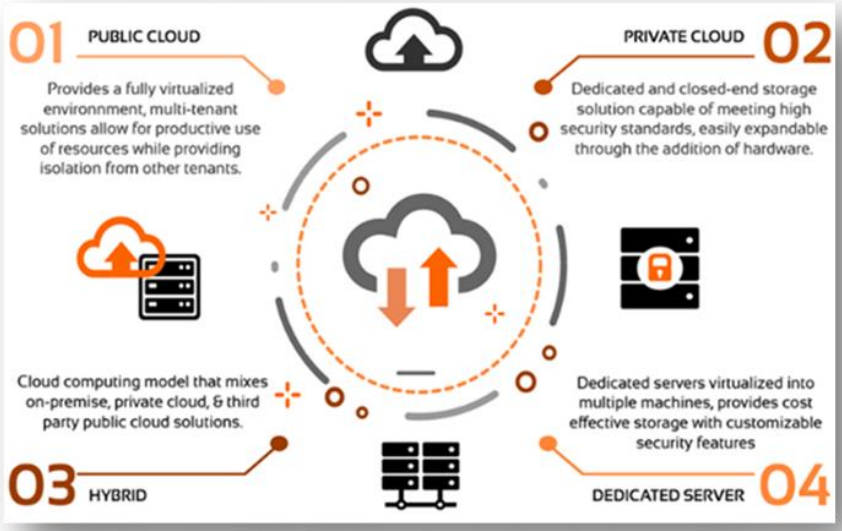
113. Cloud computing technology involves delivering different types of service over the internet. All these services are stored in the cloud and exist in some digital space. From software to secure and safe data storage and networking resources, everything can be delivered via the cloud. It refers to the use of computing power that is located elsewhere, in 'the cloud' of remote networks.

114. According to the National Institute of Standards and Technology (NIST), cloud computing is a pay-per-use model that supplies available, convenient, on-demand network access into the shared pool of computing resources that can be configured. Resources include networks, servers, storage, applications, and services that can be provided quickly and simply, with less management effort and very little interaction with the service provider. The costs of computing, hosting, storing content, and distribution are decreased considerably since the cost is shared by many users.

115. The essential characteristics of cloud computing that makes it more relevant in the process of enhancing the customer experience:

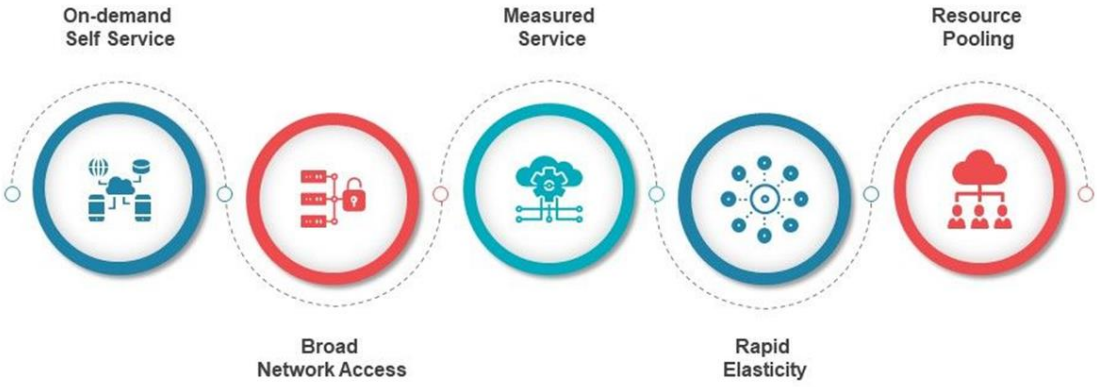
- **On-demand self-service.** Users can unilaterally provision service time and network storage without requiring human interaction with the service provider.
- **Broad network access.** Services are delivered and accessed over a network through internet-enabled devices such as a phone or laptop.
- **Resource pooling.** Different client-demanded physical and virtual resources are dynamically assigned to serve multiple users using a multi-tenant model.
- **Rapid elasticity.** Its capacities automatically adapt to the varying demands of users at any time.
- **Measured services.** Use of resources is tracked, controlled, and monitored by metric to provide transparency for both provider and consumer of cloud computing technology.

**Figure 12: Cloud Computing Service Deployment Model**




*Cloud deployment models indicate how the cloud services are made available to users, where the infrastructure for the deployment resides and who has control over that infrastructure*

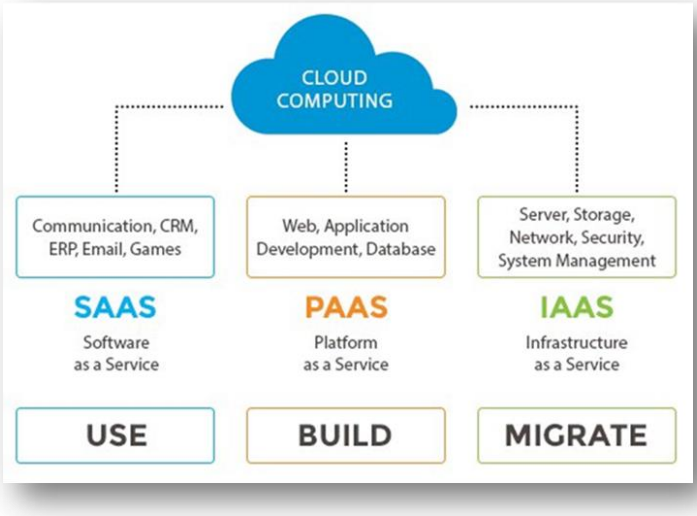
Figure 13 : 5 Essential Characteristics of Cloud Computing




116. To understand different variations of cloud service in practice, it is important to consider these three modes.

- Infrastructure as a Service (IaaS): A provider offers customers pay-as-you-go access to storage, networking, servers, and other cloud computing resources.
- Platform as a Service (PaaS): A service provider provides cloud-based access in which apps can be developed and delivered to customers. The supplier provides the infrastructure underlying this.
- Software as a Service (SaaS): Software and applications are provided through the internet by a service provider. The software is subscribed to and accessed by users via the web or vendor APIs.

Figure 14 :Cloud Computing Service Models




**Use of cloud computing in the tourism sector**

117. Considering its multiple uses and easy adaptability, cloud computing becomes an essential technology for the tourism industry. As popularly believed, 'Information is the lifeblood of the tourism industry,'—that is, providing accurate and timely information to the average customer is an essential part of the functioning of many tourism firms. Cloud computing becomes an essential tool in providing such timely information. As the tourism industry is relatively seasonal, an increasing number of guests during the peak season may become too much for the servers to handle. Cloud computing offers a scalable solution to help its users deal with the seasonal rush. Travel agencies and tourism companies can increase or decrease their storage needs in the cloud according to this seasonal demand.

118. The tourism industry deals with sensitive information such as passports, identity cards, and financial information on a daily basis. Thus, cloud providers help keep critical data safe

through secure and encrypted solutions, firewalls, backup recovery, and redundancy. Although the level of service provided may vary from provider to provider, cloud computing helps to keep data safe, secure, and easily accessible at all times.

119. As the tourism industry is always on the move, cloud computing allows remote access to websites, booking tools, and applications from across the globe with just a simple internet connection.

120. Use of cloud computing in the tourism industry: cloud computing has been widely adopted across some of the core technologies, enabling tourism firms to function efficiently. Some examples are central reservation systems and service provider websites.

| | |
|---|---|
| **Accommodation service providers** | Service providers can use a fully integrated cloud-based property management solution that streamlines hotel operations and management such as SaaS, which is a robust front desk management system. The most widespread use of SaaS in this sector includes enabling online booking services and management of the same. This cloud computing service helps accommodation service providers anticipate and address the needs of every tourist and centralize accounting, booking, and customer relationship management through a reservation system.<br><br>Accommodation services have a great deal of sensitive data, such as guest passport information, identity cards, and bank account details. Cloud computing helps with easy and safe data storage for all customers. Cloud computing is scalable—that is, the cloud storage can be increased to suit the needs of the service provider and the number of guests. |
| **Food and beverage establishments** | Food and beverage establishments can use cloud computing to increase operational efficiency; they can use it to manage booking and reservation services. They can centralize operations for booking, delivery, front desk management, and other administrative back-office operations. |
| **Aviation service providers** | Aviation service providers can use cloud computing to reinvent and optimize their daily operations. With cloud computing, the aviation industry can adopt a pay-by-use model in order to avoid the upfront purchases of expensive software. It will help in adopting technology more quickly and also de-risk against technology obsolescence. |
| | The Heydar Aliyev International Airport in Baku, Azerbaijan, has become the industry's very first 100% cloud-based airport. All users at the airport now work from a single view of operations without the need for manual operations, allowing for better allocation of resources. The cloud-based common use system provides Baku with greater flexibility when it comes to passenger processing, allowing it to check-in passengers anywhere with an internet connection, including off-airport.[12] |

12. https://airport-world.com/baku-becomes-worlds-first-fully-cloud-based-airport/

| | |
|---|---|
| **Transport service providers** | Transport service providers can use cloud computing technology to provide real-time information, such as pinpointing the location and speed of a bus using a cloud-based application. Such information is made accessible remotely, thereby providing real-time information to customers while improving customer safety. |
| **Tour operators** | Tour operators can use cloud computing customer solutions for maintaining customer relationships. This can be done by integrating their websites with social media sites and third-party platforms, which can provide tourism firms with instant access to customer profiles including emails, past trip information, phone numbers, and preferences.<br><br>This information can then be used to create a long-lasting relationship with tourists and win customer loyalty. It will also enable remote access for travel agents, in that travel agents can access customer information regarding bookings, cancellations, or other backups, and storage of business data. Stakeholders across the tourism industry can adopt and implement cloud computing technology and customize it to their use. For example, the Travelport cloud platform enables travel agencies, travel providers, and developers to connect with a mobile application.[13] |

Travelport Mobile Agent, a cloud-based SaaS, provides travel agents with a mobile app that reduces their desk work. It allows them to access reservations, make changes to bookings, and issue travel tickets from anywhere in the world on any device with internet connection.[10]

Thus, overall, cloud computing can be widely adopted by tourism stakeholders to enhance their operations and improve customer satisfaction.

13. https://www.tts.com/travelport-mobile-agent/

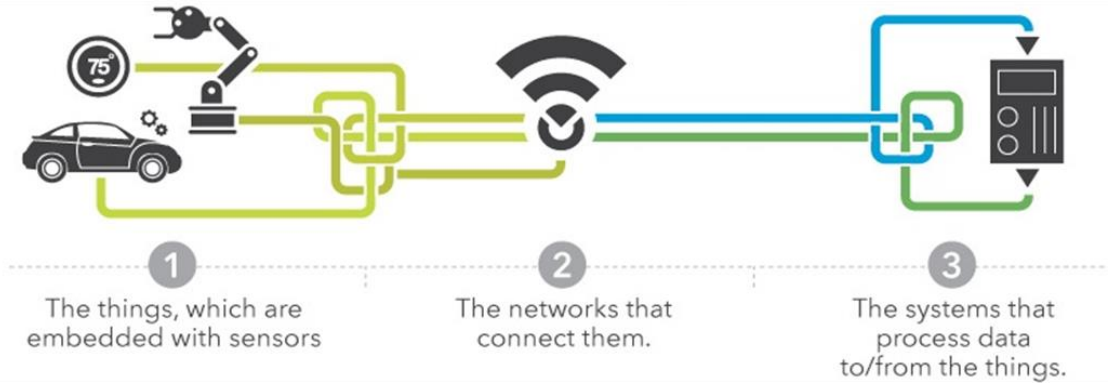
121. The tourism industry has always been witnessing changes and upgrades. The industry is quite overwhelmed with current digitalization and multiple diverse digital internet demands. IoT provides a wide upgradation and expansion of operations in the tourism industry in a more digitalized and connected way.

122. IoT refers to the vast number of 'things' that are connected to the internet so they can share data with other things—IoT applications, connected devices, industrial machines, and so on. Internet-connected devices use built-in sensors to collect data and, in some cases, act on it. IoT connected devices and machines can improve how we work and live.

123. IoT is the concept of connecting any device (so long as it has an on/off switch) to the internet and other connected devices. IoT is a giant network of connected things and people, all of which collect and share data about the way they are used and about the environment around them. IoT describes a system where items in the physical world, and sensors within or attached to these items, are connected to the internet via wireless and wired internet connections. Sensors can use various types of local area connection such as radio frequency identification device (RFID), near field communication (NFC), Wi-Fi, Bluetooth, and so on. Sensors can also have wide area connectivity such as Global System for Mobile Communication (GSM), general packet radio service (GPRS), 3G, and long-term evolution (LTE).

124. The IoT system could be an interactive system that allows the end user to make changes through the mobile application—for example, adjust temperatures. Some of the systems could be designed to perform the tasks automatically—for instance, generate an alert if the temperature is found to be too high.

**Figure 15: Main components of the Internet of Things**




*Source: https://www.sas.com/*

125. The functioning of IoT can be described in four stages:

- The first stage involves the use of a sensor/device that collects data. The data could range from temperature reading to location or other relevant information.
- The second stage is when data is uploaded onto the cloud. The connection of the sensor to the cloud could be through a Wi-Fi connection, satellite, Bluetooth, a lower-power wide area network, or directly through the internet/ethernet.

- The third stage is when the data has been uploaded, it is processed. Data processing could be as simple as temperature scanning or as complex as crowd control.
- The fourth stage involves the user interface. At this stage, the information is made available to the end user. This could be either a notification or text message alert.

126. Use of IoT in the tourism sector:

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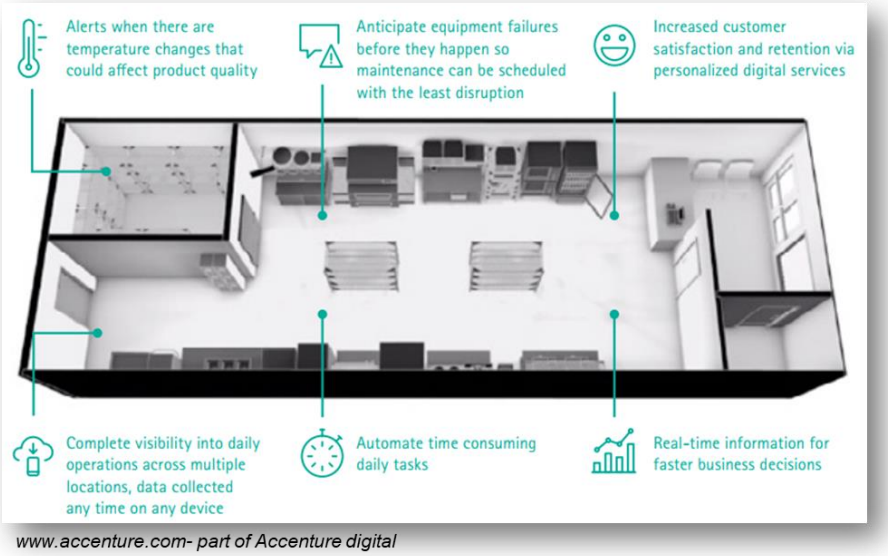
| **Accommodation service providers** | Accommodation service providers can employ IoT to give a customized experience to their customers, such as an in-room tablet/device or mobile application installed in the guest's smartphone that allows guests to have a personalized experience as per their needs. Guests can have control over various devices and components such as adjusting room temperature, TV, AC, heaters, and room lighting control, all at the touch of a button. A contactless check-in to the room can also be made available with electronic key cards sent automatically to guests' smartphones. Smart locks will ensure security by allowing guests restricted access to facilities on demand. |
| **Food and beverage establishments** | This technology can help to replace paper menus by enabling a contactless digital menu, which can be obtained on the guest's mobile phone with the simple scanning of a QR code. Furthermore, this technology can enhance tourist decision-making in real time.<br><br>With the help of IoT, service providers can improve the accuracy of inventories, reduce food waste, and monitor food quality. Largely, IoT can help to enhance food quality and compliance with food safety regulations, to lower energy costs and reduce food waste, to reduce the total cost of ownership for key assets such as refrigeration units, and to reduce overall costs in kitchen operations. This is done by placing sensors across all devices and centrally monitoring their energy usage. It will also help to lower labor costs and increase employee efficiency and productivity. Real-time monitoring with the use of sensors of all connected equipment enables granular measurement of energy consumption. This enables managers to |

- Enhanced food quality and compliances with food safety
- Lower energy costs and reduced food waste
- Lower labor cost and greater employee efficiency and productivity
- Reduced cost of ownership for appliances such as oven and fryer

*www.accenture.com—part of Accenture Digital*

**Figure 16 : 5 ioT-enabled Commercial Kitchen elements**




*www.accenture.com- part of Accenture digital*

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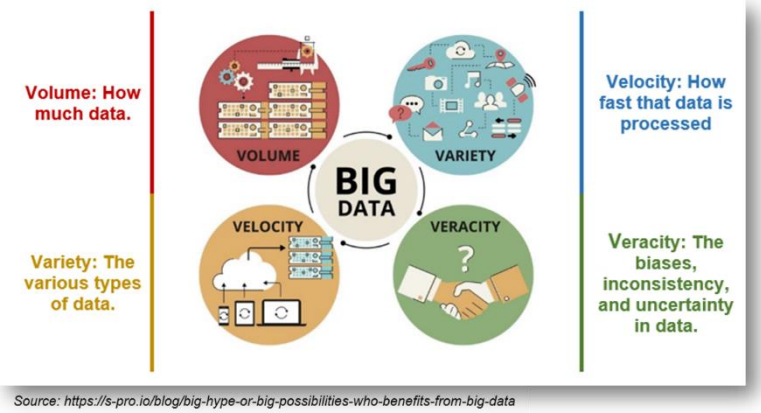
| | monitor, identify, and correct suboptimal levels of energy consumption. This can also be crucial in identifying green initiatives. |
| | IoT will extend visibility into restaurant operations beyond the immediate restaurant manager. It enables regional managers, franchise owners, and corporate decision-makers, in real time, to monitor key data on multiple restaurants from anywhere, anytime. By employing sensors and connecting to a central control system, key analytical information can be provided to all stakeholders. |
| **Aviation service providers** | The aviation industry can make use of IoT to increase operational efficiency and reduce costs. Passengers can be provided with real-time information and notifications about flight status, flight delays, gate information, and boarding. Baggage tracking can be made easier and more accessible by attaching sensors to luggage. Sensors and RFID tags attached to bags will be beneficial for travelers who have lost their baggage, allowing airlines to locate and deliver missing baggage quickly. Airlines and aviation service providers can use IoT for back-office operations. Sensors on jet engines and airplane parts will be able to provide real-time information about aircraft parts and systems and notify maintenance staff when items need to be replaced or repaired. Sensor-enabled aircraft wings will convey information and data through the satellite and cloud to stakeholders through the assistance of service providers to and from the runway. |
| **Transport service providers** | Railway systems can employ IoT to enhance their reliability and functionality. By adopting IoT, railway systems can achieve operational efficiency in information, train control systems, predictive maintenance, smart infrastructure, and energy efficiency. Adopting IoT technology can improve safety and convenience and reduce the overall cost for the railway system. Passengers can access important information such as train schedules and delays or make reservations and book tickets from their smartphones. Railway service providers can use IoT for efficient back-office operations. IoT technology will enable service providers to communicate, control, and monitor track conditions, signaling systems, surveillance, and emergency communication with the help of sensors and actuators of IoT technology. |
| **Tour guides and site managers** | Tour guides and site managers can employ IoT to enhance the tourism experience. Smart sensors can be attached at various points of tourism sites/destinations to provide information about the destinations. Through these sensors, tourists will be able to find information easily on everything they need from their smartphones. |

IoT has wide adaptability across the tourism industry and the ability to offer advanced interconnection and communication among devices, systems, and services.

127. Often, tourists receive travel-related advertisements or news tailored to their interests and in-line with their previous searches. These data-driven actions based on trends makes it easy both for tourists to make choices and service providers to reach their target market. Data is one of the most crucial tools for running a business today. It is popularly believed, 'Data is the currency of the future.' This refinement is just one of the most common functions of big data and analytics.

Figure 17 :Main Characteristics Big Data Resource




Source: https://s-pro.io/blog/big-hype-or-big-possibilities-who-benefits-from-big-data

128. Big data is the capability to manage a huge volume of disparate data at the right speed and within the right timeframe to allow real-time analysis and reaction. Big data is typically broken down into three characteristics.

129. Business analytics is an interdisciplinary science about processing a large set of data using statistical methods to extract insights about the data. These extremely relevant large data sets are too complex to be understood and are to be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions.

130. **Use of big data and business analytics in the tourism sector.** The role of big data and business analytics begins at the very inception of the tourism experience—that is, from the browsing and planning stage right through until the end of the tourist's trip, and beyond the trip, in the form of feedback data.

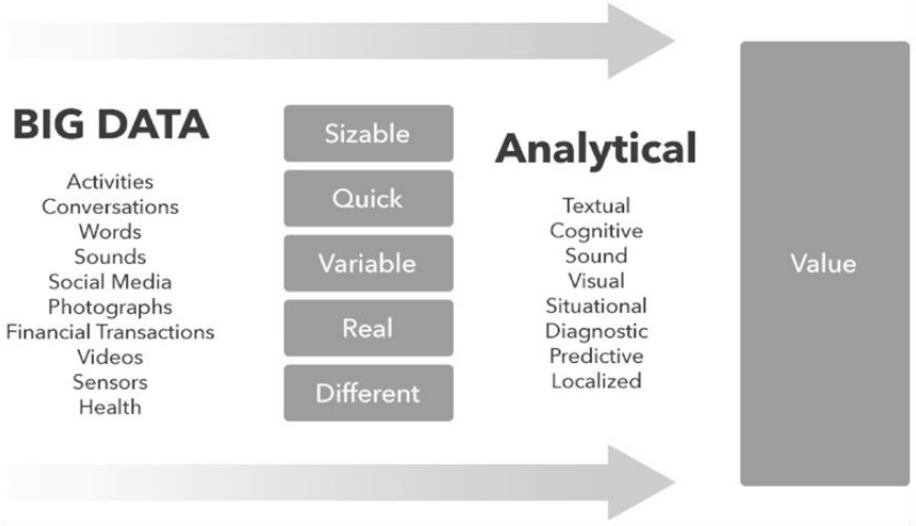
- This enables automatic data collection from multiple user-interface sources.
- The lack of human interference in the process reduces all possible manual errors, making the generated information, trend, and patterns more reliable and accurate.
- Manually performing this process of analyzing the vast amount of information is far too time-consuming; it is preferable to use the time that would be spent processing data in acting on it instead.

131. Just having the information is not enough; the data needs to be used effectively. Countries and service sectors involved in tourism need access to the tools that help in drawing actionable conclusions from the big data. Business analytics is the use of algorithms, scientific methods, and systems to extract knowledge and provide insights from data. Business analytics is an umbrella term that encompasses data analytics, data mining, machine learning, and several other related disciplines. This helps service providers in trickling down data, which leads to making informed decisions. Business analytics, in simple words, is a multidisciplinary frame that combines people,

WTTC has launched a data analytical tool that has been keeping track of traveler demands since the start of the year. As travel restrictions are slowly lifting and the tourism industry recovers, the tool will provide useful insights for companies over the world.

processes, computational and big data platforms, application-specific purpose, and programmability.[14]

**Figure 18: Different Big data-based data sources in the tourism Industry**




https://www.edureka.co/blog/artificial-intelligence-algorithms/

132. Together, big data and business analytics can greatly impact and further direct and steer the travel and tourism sector in the desired direction. Many of the advantages benefit the tourist as well as those employed in the tourism sector.

133. Use of big data and business analytics in the tourism industry:

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| **Accommodation service providers** | The most effective use of big data within the accommodation sector in the travel industry is linked to revenue management. Big data can be used to improve profit margin and provide an overall better experience to customers. Big data and business analytics can be invaluable in maximizing financial results, hotels, and other accommodation providers essentially to be able to offer the accurate product, to the target customer, at the exact moment, for an affordable price, via the accurate channel. |

14. https://wttc.org/News-Article/WTTC-launches-interactive-COVID-19-Travel-Demand-Recovery-Dashboard

Big data and business analytics can help in preparing for the future; this is called predictive analysis. By analyzing past trends and occupancy rates, service providers can have detailed insights and thus prepare for future demand. This, in turn, helps maximize profit. Hotels and accommodation providers increase their rates on weekends to earn more profit from weekend business with the use of predictive analysis.

Some real-life implementations of this prediction help many companies such as Hilton and Marriott to set dynamic room pricing. The rates have changed once or twice a day since 2004, according to Marriott's annual report.[15]

A classic example of the role of big data and business analytics in the hospitality sector, Starwood Hotels started developing a predictive analytics tool in 2015. The tool considers hundreds of factors to display the most efficient price for the moment. These include competitive pricing data, a user booking pattern, occupancy data, room types, daily rates, and other intangible variables such as the weather.[12]

**Food and beverage establishments**

Another important use for big data within the tourism industry is in connection with reputation management. The reviews and ratings that are updated on a daily basis greatly impact the business received, especially by the food industry. Tourists largely judge the reputation of a service provider based on online ratings. In the internet age, customers can leave reviews on a wide range of different platforms—including social media sites, search engines, and dedicated review websites—sharing their opinions and experiences. Big data and business analytics help in gathering and processing this data into an understandable format. Hotels can use it to make advances, frame their e-commerce strategy, and ensure positive reviews in the future.

In the digital transformation era, big data and business analytics together have gained a crucial role in changing global travel and providing advantages and opportunities for established companies, as well as new entrants into the tourism industry. In a relatively new industry development, Telefónica and UNWTO have worked together to launch a series of visualization tools within the UNWTO Global Data Dashboard that allows for a better understanding of key performance indicators in tourism.

**Aviation service providers**

Predictive analysis also helps service providers decide whether to give distinct discounts on booking at certain times (such as festivals and general holidays) or to specific customers (based on birthdays, anniversaries, and so on). Smart tools like big data and business analytics monitor and send out timely alerts with relevant deals to customers and helps improve price forecasting. Reviews and ratings greatly impact the business received by service providers or the mode of transport chosen depending on reviews provided by previous tourists. Hence, it is important to understand, collect, and analyze these bulk reviews and improve performance accordingly.

15. https://marriott.gcs-web.com/static-files/8799734e-b9e0-4e53-b194-7bd24a381118

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| | The airline services in the travel and tourism industry use big data for market research in compiling and analyzing information about their main competitors and gaining a clearer understanding of what other airlines are offering to their customers. This data can be acquired from a variety of sources, as there is no shortage of places where customers share opinions, especially online, about their airline travel experience. The data can be used to pinpoint the strengths, weaknesses, and overall reputation of rival companies. This can be extremely valuable, as it can help business leaders to spot potential gaps in the market or opportunities to deliver in ways that rivals are failing to. This can, in turn, lead to greater demand and higher revenue.<br><br>In sentiment analysis and reputation management, Google Cloud Natural Language API is an application programming interface that can be tweaked and integrated with analytical tools to provide real-time analysis of all brand-related reviews.<br>*https://cloud.google.com/natural-language* |
| **Travel and tour operators** | Within the travel industry, marketing can be demanding because of the varied potential customers who have dissimilar origins and needs. However, this technology can help tourism companies to implement a new strategic approach to their marketing efforts. More specifically, big data can help businesses to pinpoint the main trends that exist among their customers, spotting the similarities and the best marketing opportunities that exist. This can also help businesses to understand where and when marketing is most significant to them. This can enable marketing messages to be sent, based on time, context, and many other data, delivering hyper personalized promotional content. |
| **Tour guides and site managers** | Individual businesses in the travel and tourism industry have a vast array of interactions with customers. Each of these interactions can provide valuable data, which can be used to improve the overall customer experience and zooming in on personalization. This data can include everything from social media conversations and online reviews to service usage data that can help in expanding the market size. |

134. However, overall, tourism industry providers must respond to these trends in an increasingly competitive business landscape, particularly in markets where the supply base is growing faster than demand. Big data can benefit those in the travel industry in many important ways, allowing them to make more evidence-driven decisions. These include the ability to anticipate future demand more accurately, optimize pricing strategies, target marketing more precisely, and improve the customer experience.

## Geofencing Technology

135. A tourist, knowingly or unknowingly, encounters geofencing technology several times during their travel. While entering a particular region, a tourist's smartphone is notified of the nearest restaurant, hotel, or tourism destination. Many service providers have advertisements that attract tourists from a distance, informing them about the services they provide. This is the use of geofencing technology in the tourism sector.

136. A **geofence** is a virtual fence or border around a physical location. When an object/device such as a mobile phone enters this area, some context-specific new actions/services are activated.

137. Geofencing technology is employed by service providers for various purposes. One of the most notable is the use of technology by social media providers. Snapchat, for instance, allows the user to apply filters depending on their location, such as area/city/country. Entertainment service providers can employ the technology for crowd engagement and giving relevant information at the venue. Security service providers also employ geofencing technology to keep a check on the number of people entering a region. Similarly, many brands use geofencing technology for in-store promotions and to attract crowds, thereby helping them to target their best market. Lately, many governments and administrations across the world have mandated the use of contract tracing apps employing geofencing technology for controlling the spread of Coronavirus.

138. Owing to its wide applicability and uses, geofencing technology may not have a single definition. There are two types of geofence technology. Active geofence depends on the end user and uses location services such as GPS or RFID. Passive geofence stays active at all times; it depends on cellular data via mobile devices or Wi-Fi internet connectivity rather than RFID and GPS. It works in the background when the location service on a smartphone is enabled.

139. **How does geofencing technology work?**

How geofencing technology works can be explained in three steps:

- The first step involves the setting of a 'barrier' or a specific geographic area using GPS or RFID, Wi-Fi or Bluetooth-enabled software. This can be 100 feet around a point on a Google map or an entire district/city, depending on the API setting of the developed software.
- The second stage is when an identified tourist 'crosses' or simply enters or exits the geographic location, the administrator of the app/software is notified. The identification of the tourist is done either by prior registration of the mobile number or through an app downloaded by the tourist. This is usually done via Bluetooth, GPS, or a Wi-Fi connection.
- The third stage is when the tourist is 'alerted.' The alert could be sent through a text message, push notification, or digital ads.

In Azerbaijan, free Wi-Fi has been installed in the capital city Baku in more than 20 public parks since 2018. The first ever tier-three data center in the Caucasus region to turn Azerbaijan into a regional information transit center was established in Baku in 2016. Azerbaijan assigns considerable priority to the country's e-service expansion. Nearly 500 government programs are officially delivered through the single platform—e-Government portal.

*Azerbaijan ITU*

140. **Use of geofencing technology in the tourism industry.** Various stakeholders in the tourism sector have already employed geofencing technology and others can do the same to enhance their services. For the smooth functioning of the application, 'permission' is crucial. The geofencing technology can function smoothly only when a tourist allows the application to use its GPS location.

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| **Accommodation service providers** | The accommodation service provider sector can employ geofencing for aggressive marketing tactics. As soon as the guest enters the accommodation premises, welcome messages and greetings can be sent to their smartphone. After check-in, information about in-room food options, coupons, spa and massage offers, and room upgrade opportunities can be sent to the guest's smartphone. Similarly, by placing Bluetooth sensors across hotels, service providers can find the most popular tourist destination near their accommodation.[17] |
| **Food and beverage establishments** | Food and beverage establishments can employ geofencing technology to attract more visitors and expand their market. Restaurants and cafes can generate limited coupons/discount vouchers for crowds within a certain range of the restaurant; visitors within the area will be notified about the same. This will help in attracting a maximum number of visitors to the restaurant. Service providers can also identify their recurring visitors and can award personalized loyalty discounts. |
| **Transport service sector** | Transport services can employ geofencing technology to enhance their services. Geofencing technology can be employed to alert users about traffic updates and restrictions. The technology can also be used to inform users about the closest transportation options that are available in the area. |
| **Tour guides and site managers** | Tour guides and tourism site managers can employ geofencing technology to enable location-based solutions in real-time location detection to understand, engage, and retain tourists. Tour guides can use geofencing technology to coordinate with all the tourists at a single site. This can be made possible by sending notifications or messages to all tourists within the tourism site.<br><br>Security services can use geofencing technology to maintain safety and security standards. For instance, a virtual boundary can be created around an office. Whenever a vehicle or person, with a location-aware device, enters or exits the area, a notification is sent out to the security administrator. |

In India, the Aarogya Setu app has been made mandatory for air travel across the country. The contract tracing app has been assisting in controlling the spread of the virus in the country. The app asks for information such as name, phone number, identity proof, any symptoms of the COVID pandemic, and an updated real-time record. It traces the person's movements and generates an alert if any COVID-19 positive person is found in neighboring areas.

*https://www.loc.gov/law/help/coronavirus-apps/india.php*

141. One of the most important guidelines to comply with the ongoing COVID pandemic is limiting human interference and interaction. Robotics technology can be crucial in ensuring the same by automation of routine tasks that otherwise would have involved human intervention.

142. Robotics technology of the usage of a machine that imitates a human with enough 'commonsense' fed to interact reliably with a dynamic world. It contains sensors, control systems, manipulators, power supplies, and software all working together to perform the intended task.

143. One of the most fascinating developments in the travel and tourism industry is the introduction of customer interactive robots. Even before the spread of the COVID pandemic, many hotels and restaurants had introduced robots as waiters or receptionists to interact with customers and enhance their experience. Robots not only ease the customer experience but also provide an amusing experience. Given the backdrop of the COVID pandemic, robots are being adopted at all levels and across all stakeholders across the tourism industry chain. The primary reason for the adoption of robots is the resulting increase in productivity, accessibility, and service augmentation.

144. As complex as the functioning of robots may seem, a robot is just a man-made machine that replicates human and animal behavior. The body of the robot is a physical human-like structure: a motor, a sensor system, a power supply, and a computer 'brain' that controls all of these elements. Robots require a certain level of computer programming that defines the task the robot needs to perform; without the code being programmed, it is just another piece of machine. Robots also require a level of power support, either through electricity or battery. Robots can be trained according to the nature of the work assigned to them.

145. To understand the functioning of robots, it would be best to look at Doris—a robot specifically designed to cater to tourists. Doris, developed in Germany, is an example of a mobile robot designed to interact with tourists in indoor environments such as museums, restaurants, theaters, hotels, and trade fairs.

    The body of the robot (Doris) consists of three parts: 1) platform, 2) skeleton, and 3) head. The platform, which has built-in sensors (bumpers, sonars, and laser), all connected to the serial port of the internal computer. This computer is equipped with USB ports, ethernet, and a Wi-Fi connection. The skeleton, attached to the mobile platform, is made of methacrylate, holds up speakers, the RFID antennas, a USB hub, a PoE switch, and the robot's head. While the robot's head connected to the skeleton, which is speech capable, interacts with the customer.[18]

A typical example of robotics in the tourism sector that is specifically designed to cater to tourists—Doris. Doris is an example of a mobile robot designed to interact with tourists in indoor environments such as museums, restaurants, theaters, hotels, and trade fairs.

146. Use of robotics technology in the tourism industry:

18. The DORIS Offshore Robot: Recent Developments and Real-World Demonstration Results—http://dx.doi.org/10.1109/ROBOT.2005.1570423

Robots can greatly enhance the efficiency of the tourism business. Stakeholders can employ robots and customize their device as per their need.

**Accommodation service providers**

Accommodation services can employ robots at various points for both customer engagement and back-end operations. Robots can be employed as receptionists to limit the human interaction and spread of the COVID pandemic, smoothen the customer check-in process, and reduce costs.

For back-end operations, such as cleaning, many hotels have employed automatic robotic cleaners that are programmed to perform the entire cleaning process. 'Cleanse bot' is one such product that cleans all germs and viruses off bedsheets by simply using motion sensors and UV rays to kill germs and viruses.

In Japan, even before the onset of the COVID pandemic, Henna Hotel was recognized as the first hotel to adopt robots as receptionists to provide information at the front desk. In one of the hotels, reception, concierge, and room cleaning services are undertaken by robots.

Hilton Hotels have partnered with IBM for a robotic assistant called 'Connie,' an artificially intelligent concierge, to interact with visitors, using speech recognition technology to respond to their queries.[19]

**Food and beverage establishments**

Restaurants can employ robots as waiters to limit human contact, amid the spread of the COVID pandemic, and minimize the scope of human error in the dining experience.

In China, the world's first-ever 'robot restaurant complex' has opened in Guangdong province. The restaurant has more than 40 robots, capable of serving and cooking over 200 dishes. Guests make their orders with robot waiters; their food is then delivered directly to their table from a sky rail system or brought in on a tray. Robots can also be employed to take orders, deliver prepared meals, deal with a customer query, heat, or reheat customer's food.

**Aviation service providers**

Robots have been widely adopted across various airports and by airline service providers across the globe. According to a report by the 2019 Air Transport IT Insights survey, SITA, robots are a part of pilot projects at 40% of airlines and make up major programs at 14% of carriers. It reported in 2018 that nearly half the world's airlines and almost a third of airports wish to invest in robotics. A robot can be employed at various points in the passenger journey. For check-in, a combination of AI and robotics can be employed to scan passenger boarding passes, thus reducing the wait time and inefficiencies in the procedures, in turn, the passenger's overall journey.

19. https://www.ibm.com/blogs/watson/2016/03/watson-connie/

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| | At Schiphol Airport, Amsterdam, robots were tested between November 2016 and March 2017 to scan passenger boarding passes and guide them to the gate. Robots can also help in easy baggage handling. With embedded sensors and RFID tags, robots can carry passenger luggage and travel along with the passage to replace the manual labor of carrying trolleys.<br><br>An AI-enabled robot, Josie Pepper, aids at Munich's International Airport. Similarly, Triokia provides information at Seoul International Airport.[20]<br><br>For providing a personalized experience and customer queries, AI-supported robots have been deployed at various airports across the world that cater to customer queries, and provide information such as airport gates, restaurants, and so on. |
| **Transport service providers** | Robots can also be used for safety and security reasons. At China's Shenzhen Bao'an International Airport, Anbot, an AI-enabled guard robot, is employed that uses facial recognition technology for patrolling and maintaining safety and security. |
| **Tour guides** | Tour guides and site managers can employ a robot as a tourist guide. For instance, in France at the Museum of the Great War, anyone in the world will be able to view the museum through their computers with a pilot robot with a camera operating as a tour guide at the museum.<br><br>In Japan, a robot named Robohon accompanies a tourist through Kyoto. The robot not only provides information but also works as a camera for the tourist to click photos.[21] |

Hence, robots can greatly benefit tourism industry stakeholders; they ensure contactless services rendering all operations safe by minimizing human interaction touchpoints. In the long run, robots also help in reducing inefficiencies, automating routine tasks, and cutting down additional costs.

20. https://www.munich-airport.com/hi-i-m-josie-pepper-3613413
21. https://www.japantimes.co.jp/news/2018/09/11/business/sharps-humanoid-robohon-robot-guide-tourists-kyoto/

## Extended Reality

147. Even before the pandemic, various sectors in the tourism industry had begun designing and prototyping virtually designed journeys that leverage digital tools to deliver an immersive experience. Now, the pandemic has brought in a heightened need to address tourist safety concerns and demands. Various technologies are being employed to ease the tourism experience. One of the most talked-about technologies that not only enhances the tourism experience but also adds a layer of virtual real-life experience is the use of extended reality (XR).

148. XR is an umbrella term used to define the kind of technology that enhances reality either by providing additional information or by a simulated reality experience. In short, XR is a combination of real and virtual environments generated by computer technology and wearables. It includes augmented reality (AR), virtual reality (VR), and mixed reality technologies.

149. **AR.** One of the emerging technologies most altering consumer experience across many sectors is the use of AR. Commonly, in many public places, 3D images or graphics of brands or animations can be seen, attracting the attention of the man in the street. The technology behind this display is AR.

150. AR may look like a complicated technology; however, it can be defined as the technology that provides a real-world experience through digital visual elements, sound, or other sensory stimuli by turning the environment around the user into a digital interface by placing virtual objects in the real world, in real time.

**Figure 19: Augmented Reality to explore city history**


*https://www.dreamstime.com/*

151. AR can be categorized into three popular uses:
- AR 3D viewers allow users to place life-size 3D models in their environment.
- AR browsers through camera display with contextual information—for example, by pointing your smartphone at a building to display its history and additional information.
- AR through gaming, creating immersive gaming experiences that utilize the actual surroundings—for example, Pokémon GO.

152. Functions of AR technology:

- The AR application captures an image of the surrounding environment.
- The AR application then scans the image and determines where it should be overlaid with the AR objects.
- Then, the app sends a request to the database for obtaining proper information.
- The end product, the AR application produces a comprehensive picture by overlaying all the captured images of the environment with information.

153. Recent innovative AR experiences that showcase the potential of technology to revolutionize the way tourists experience new destinations and services within the industry include an enhanced booking experience, museum interactivity, AR browsers in the destination, responsive experience through gaming, augmented restaurant services, re-living historic life and events, the AR hotel experience, augmented transportation, AR translation, participative destination management, and the most recent AR technology implementation—urban augmented reality (UAR).[22]

The Netherlands Architecture Institution launched a free UAR smartphone application that enables tourists to experience the urban environment 'as it once was,' 'as it might have been,' and 'as it would be in the future.' The smartphone displays different layers of information (text, images, video, and archive material) and 3D building models based on a user location in the real world (through the use of GPS). The database allows the traveler to add comments, thereby efficiently soliciting public opinion.


154. The users collectively interact and process the complete information in the blink of an eye. Moreover, in many AR applications, the user comes in direct contact with the virtual objects.

155. **VR.** VR is the use of computer simulation and modeling technology to provide the user with an immersive interactive 3D experience, which may be real or imaginary. This is through interactive devices that exchange information. These devices can be goggles, headsets, gloves, or bodysuits.

156. VR technology functions with the user wearing an object that could be a helmet or goggles with a stereoscopic screen—one that lets them experience 3D illusion/animated images in a simulated environment. Largely, VR builds on pre-existing information developed in the brain. For instance, the sky denotes an upward direction. Shadows inform the source of light to the user. A simulated virtual world includes this already existing knowledge of the surroundings while including additional attention-grabbing information.

22. https://nai.hetnieuweinstituut.nl/en/uar

UNICEF Tajikistan organized a VR experience corner at the International Disabilities Forum in Dushanbe. Through VR headsets, attendees could learn about the everyday difficulties of children with disabilities. Given the presence of the technology and its current use in Tajikistan, this technology can easily be harnessed to augment the tourist experience when visiting places of interest.[23]

157. By employing motion sensors, which pick the user's movement in real time and then adjust the view on the screen accordingly, VR facilitates telepresence—that is, an illusion of 'being there in the moment.' Hence, depending on the movement of the head, the user has a simulated tour experience with changing views and perspectives. By 'wearing data-enabled gloves' equipped with force-feedback devices that provide the sensation of touch, the user can even pick up and manipulate objects that he sees in the virtual environment.

158. Tracking sensors are essential for the smooth functioning of AR and VR to help the user have an uninterrupted real environment experience in real time. These sensors interact with a system processing unit, relaying the orientation of the user's point of view to the system. Using the sensors in combination with VR/AR systems allows the detection of the user's location, direction of movement, and speed.

159. Mixed reality is the use of both VR and AR to enhance the overall tourism experience.

**Figure 20: Mixed Reality for Tourist Information**

160. Use of AR/VR technology in the tourism industry:

XR is a great tool that has already been, and can be further, extensively adopted across the travel and tourism industry.

23. https://www.unicef.org/tajikistan/press-centre

| | |
|---|---|
| **Accommodation service providers** | Accommodation services can use XR services to improve customer experience, provide information, and serve as an effective marketing tool. Both AR and VR can be employed to give a virtual tour of the rooms and other services in the accommodation.<br><br>With the current ease of access and exposure to technology, tourists often tend not to pay attention to simple text-based pamphlets. AR makes it possible to get 3D animations from printed flyers. For example, Marriott Hotels have collaborated with Blippar to produce such interactive ads in their magazine. Hotel app users can scan the advertisement to unlock a presentation video.<br><br>Using VR, tourists can be provided with a 'try before you buy' experience. This allows hotel owners to explore the potential of an interactive marketing experience in promoting their accommodation. And tourists can seamlessly check and compare room sizes, other amenities, and additional information in advance.<br><br>Hub Hotel employs AR with an interactive wall map in every room. Guests can just point their phones to the wall surface and identify the closest local tourist attractions.[24] |
| **Food and beverage establishments** | By employing AR and VR, guests can make virtual reservations, as they can potentially choose their table by having a virtual idea of the place. Restaurants can have interactive menus with a 360-degree view of every food dish and its ingredients through AR application. This will also help non-native speakers to communicate with ease. Local tourists can point their camera at a restaurant and get all the detailed menus and reviews of that particular restaurant. |
| **Aviation service providers** | VR has been employed by various airlines for providing entertainment services in the past. Skylights, a company that provides in-flight entertainment services by deploying VR for the passenger to enjoy a movie theater experience accessing over 250 hours of content—from early-window blockbusters to documentaries in HD, 2D, 3D, and forward-facing 360 degrees. At many airports, AR gaming services are available for children to have an immersive experience of flying a plane by sitting in a cockpit-like setup with the use of AR and 'data-enabled gloves.' |
| **Transport service providers** | Transport service providers can use AR technology to provide easy and more accessible navigation services for tourists. For instance, digital maps can be provided at train stations and bus stops that let tourists see an actual image of the destination by scanning the map with their phone. |

24. https://hospitalityinsights.ehl.edu/interactive-walls-tables-are-redefining-hospitality

| | |
|---|---|
| **Tour guides** | One use of AR is to create more informative and interactive specific points of interest for tourists to enrich the tourism experience. Tour guides can employ AR to improve the customer experience by simply providing more information displayed in real time. This can be done by preprogramming an AR program for the tourism site, when the tourist places the camera onto the site, the AR recognizes the image and overlays all the information, history, and other details about the site.<br><br>For instance, at the Acropolis in Athens, the iPad mini is provided to tourists to enjoy AR and VR applications such as a 3D reconstruction of the Acropolis. Another example is to bring the story and arts on the white silos (which appear to be dull to watch without AR), such as demonstrating history, culture, and story of people in the country.[25] |
| **Tourists/ travelers** | AR and VR are key technologies to bridge the gap between the traveler and their tourism experience. Especially, given the backdrop of the COVID pandemic, tourists cannot physically be present at the tourism site but AR/VR technology can facilitate an experience closest to reality. According to WTTC's Managing Director Virginia Messina, 'even once the outbreak is under control, it would take up to ten months for the tourism sector to return to its normal levels—so we may well see the appetite for VR tourism increasing in the coming months.'[25]<br><br>Solo travelers and organized group travelers are increasingly seeking a personal connection with locals. Fostering exciting cultural tourism, intangible cultural aspects such as local lifestyle and traditions should be given added value to create authentic experiences of tourist–residents interaction, such as cooking courses, yurts, and nomadic living. Given the ongoing pandemic situation, the interpretation of cultural sites can be enhanced and rendered safer by using modern technologies of AR/VR, online conferences, queue management techniques, podcasts sent to tourists before and after the trip, and so on.<br><br>For instance, NazzAR, an XR innovative app, which integrates elements of AR into the objects of the real world. The app is being used in and around Uzbekistan at museums and tourist destinations to enhance the tourist experience and provide more information.[26] |

AR and VR can provide easy, safe, and smooth navigation services. With Google Maps being widely used across the world for navigation, an AR/VR can certainly add value to the existing features and make it easier to use.

25. https://in.reuters.com/
26 https://in.reuters.com/
26. https://nazzar.uz/location/en.html

## QR Code Technologies

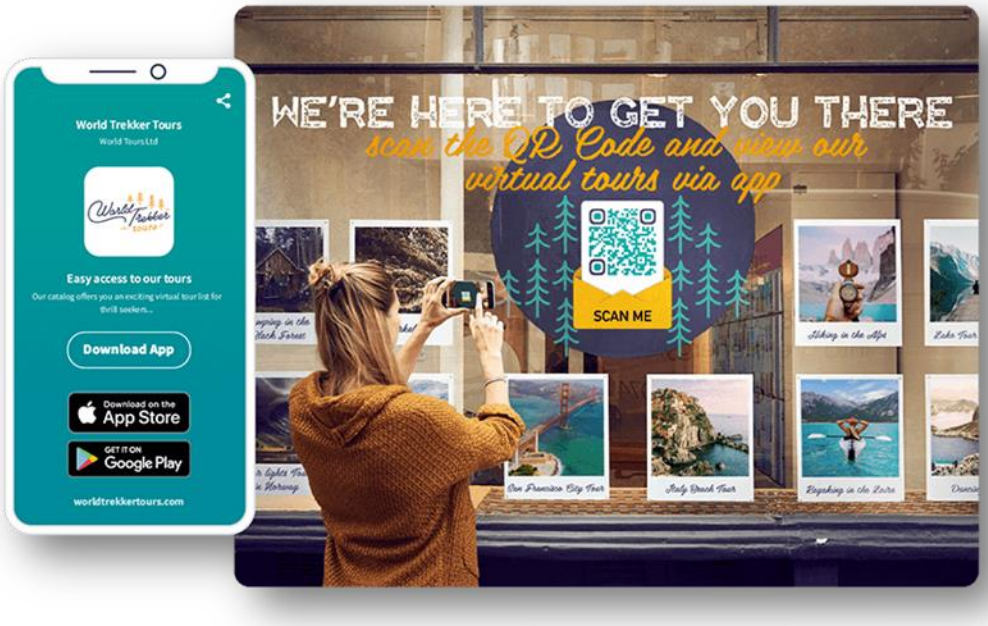
161. In the revival of the tourism industry, during and after the COVID pandemic era, the role of technology is becoming increasingly essential. Apart from the technologies mentioned earlier, there are other technologies that can play a crucial part in ensuring safe and healthy tourism. These function alone or in combination with other technologies.

162. A quick response (QR) code can be defined as a type of two-dimensional barcode. It encodes both alphabetical and numerical information. A scanner or a smartphone application can be used to scan QR codes. The difference between a barcode and a QR code can be explained as follows: a barcode provides 'product information' while a QR code provides 'product description.' When a QR code is scanned, it generates a network link from a tag and connects to the back-end database through the internet. The user can then access the database to retrieve the relevant information instantly.

163. Use of QR technology in the tourism industry:

| | |
|---|---|
| **Accommodation service providers** | QR codes can be employed by accommodation service providers in more than one way. They can replace room keys by allowing guests to enter their room by simply scanning a code via their smartphones. They can be used on cards/pamphlets in rooms, notices in elevators, or on boards in the lobby to engage tourists with information and tips. This will help in eliminating any possible human contact and provide information with a quick scan.<br><br>QR codes can be used for digital marketing. By simply scanning a QR code, users are directed to the hotel website, social media page, or blog, which contain the latest events, hotel tips, attractions, and activity recommendations. At the same time, this can help to connect the guest through social media platforms such as the accommodation's blog, Facebook, Instagram, and Twitter. |
| **Food and beverage establishments** | Restaurants can also easily utilize QR codes to enhance customer experience. Customers can scan a QR code to access a digital menu on their phones; this will help to limit human contact between the server and customers. QR code can also help in providing additional information such as calorie details, recipes, and ingredients. |

**Figure 21: App access by scanning QR Code**




**Transport service providers**
**Aviation service providers**

Transport service providers can use QR codes to replace paper tickets. Customers can now book tickets by simply scanning a QR code and making payments digitally, rendering the entire process contactless.

Airline service providers can use QR codes for check-in, boarding, and promotional services. The inclusion of a QR code will enable a passenger's smooth transit through the airport, by providing information through a simple scan of the boarding pass via the passenger's smartphone.

> Dutch airline KLM has taken a serious approach to social media by allowing fans to check in to their flights in Holland recently by scanning a QR code on the floor. Delta uses QR code boarding passes. Gate employees can scan the bar code and see the details of your flight. Scandinavian Airlines, which recently launched the 'Couple Up to Buckle Up' 2 for 1 campaign that used two unique QR codes across every touchpoint (emails, Facebook app, banners, print advertisements and so on), leveraging insight into how couples most commonly book trips.

## Applications of These Technologies for Safe and Clean Tourism

164. Some technologies are crucial in creating a safe and clean environment in which travelers feel confident to start traveling again and feel reassured that their stay would be comfortable and hassle-free. These technologies are aimed at minimizing the risk of a tourist contracting the virus. Various technologies and in combination with the above-mentioned technologies the following actions are used to guarantee 'safety and hygiene' in tourism destinations:

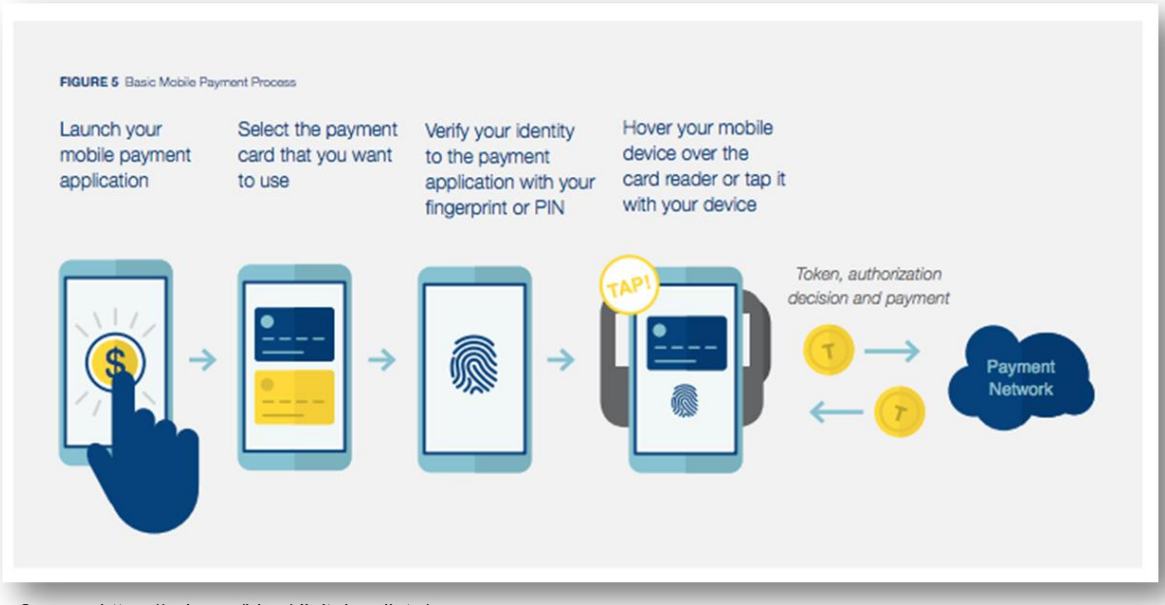
- **Contactless payments and transactions**
- **Crowd management and social distancing**
- **Contact tracing and management**
- **Sanitization and disinfection**
- **Virtual care platforms and digital learning**
- **Temperature check, thermal scanner and cameras**

### Contactless Payments and Transactions

165. Contactless payments are crucial in ensuring a safe and clean destination for tourists. Currency notes and coins are potentially infections, bacteria, and virus carriers as they change hands frequently. Contactless payments are suggested by the World Health Organization (WHO) as a way to prevent transmission of the COVID pandemic by breaking the physical-surface contact chain. These payments are conducted over internet-enabled devices and self-owned mobile devices that can be sanitized.

166. To facilitate a contactless digital payment, vendors use technologies such as SMS, NFC, RFID, QR code, Bluetooth Low Energy (BLE), digital wallets (e-wallets), blockchain technology, and magnetic security transmission (MST), among other options.

**Figure 22: The flow of a Typical Mobile Payment transaction**




*Source: https://cxl.com/blog/digital-wallets/*

167. From booking the hotel and accommodation or airline services or using transport services, the entire payment system is now digitally available, accessible, common, and functional for customer use. The contactless digital payment option has long been complementing the tourism

industry. With the help of contactless payments, tourists can have a contactless, cashless tourism experience—even more relevant during this COVID pandemic phase.

168. An example of the structure of mobile payments: China, one of the CAREC countries, is the leader in adopting contactless payments across all sectors. Of all global contactless payments, 61% were made by Chinese users. According to a survey conducted by WTTC to understand the situation, use, and adaptability of contactless payments in China, the following results were found for Chinese outbound travelers, shopping and dining are the two most common types of travel service paid by mobile payment. Convenience, speed, and security are the drivers for the adoption of mobile payments. Security is found to be both the motivation and the constraint for the adoption of mobile payments. The speed and convenience of mobile payments are as appealing to users as to non-users.

Service providers can use digital wallet services by Fintech firms such as WeChat Pay, PayPal, and Apple Pay. These platforms employ QR codes and cloud-based services to provide their services.

## Crowd Management and Social Distancing

169. Crowd management and control becomes more significant and important in the current scenario of the COVID pandemic. With crowd management in place, service providers can ensure COVID precautions such as social distancing are in place. In addition, it will help in not only tracking, directing and managing crowds but also maximizing value for each tourist by avoiding overcrowding.

170. The tourism industry is relatively seasonal; hence, a tourist destination may attract large numbers of crowds at one time. Although this may seem profitable to service providers, it often results in overcrowding.

171. Overcrowding is rather a complex problem for the tourist industry as it is not specific to one stakeholder, but all stakeholders may be affected. Countries, regions, cities, and individual sites—such as parks, beaches, museums, restaurants, and accommodation—may all face overcrowding.

172. Some service providers may experience domestic crowds, while others may experience regional or international crowds, or all three at the same time. Moreover, given the backdrop of COVID-19, it is increasingly essential to ensure that not just overcrowding but social distancing is mentioned.

173. 'Overcrowding brings an important question to light—whether the stakeholder caters to volume or the value provided.'

### Technologies used for crowd management

174. Crowd control and management can be enabled with the help of various parent technologies, through mobile-operated IoT, AI, or via computer vision technology among others.

175. In general, the goal of crowd analysis techniques based on computer vision technology is to extract some kind of information from video sequences of a crowded area that could be used for various purposes, such as surveillance and safety. For instance, a combination of AI, deep learning, and computer vision technology can identify people who are not wearing masks in a crowd.

176. While tracking the location of mobile phones and analyzing data collected by mobile-enabled IoT sensors provides an extremely accurate way to monitor and manage crowds of people, the technological functionality of IoT is discussed in the previous segment of this chapter.

## Contact Tracing and Management

177. Governments and administrations across the world have used various digital tools to control the spread of Coronavirus. One such use of technology is to facilitate contact tracing that has effectively assisted in controlling the virus. This is done by tracking people's movements and the people they come in contact with, via handheld devices such as smartphones. Bluetooth and GPS technology is used to estimate the proximity and duration of an individual's exposure to patients diagnosed with COVID-19. There are two key types of tool that enable contact tracing: a 'case management tool' and a 'proximity tracing/exposure notification tool.'

178. **Proximity tracing/exposure notification tool.** Notifies individuals via smartphone of potential exposure and refers them to the health department for a follow-up. It uses Bluetooth or GPS technologies to estimate the proximity and duration of an individual's exposure to patients diagnosed with COVID-19.

179. **Case management tool.** Streamlines the electronic capture and management of data on patients and their contacts. A case management tool can be used for the following:

- Providing workflow support to assign and manage communication and follow up with patients.
- Notifying patients of a forthcoming call from the health department to increase the likelihood of call acceptance.
- Generating secure, confidential electronic surveys for the patient to fill out to provide a head start on the patient interview.
- Sending daily automated phone, email, or SMS illness or symptom monitoring checks, reducing the phone call burden required by case investigation staff.
- Alerting health systems when referrals and support services are recommended or required.

180. For instance, by deploying digital contact tracing, if there is a COVID pandemic-positive person that comes in contact or near other people, people are notified or alerted with the help of an app or text message of a potential spread of the virus. Similarly, containment zones—that is, areas with a high number of COVID pandemic cases—are continuously monitored. Anyone who enters the area is notified about the risk of contracting the virus and his/her movement is further monitored to track the potential spread of the virus.

181. South Korea has issued mass cell phone alerts announcing locations visited by infected patients and has ordered a tracking app to be installed on the phone of anyone ordered into isolation. Hong Kong and Taiwan use GPS and Wi-Fi to monitor people in quarantine.

**Figure 23: Contact Tracing and Management**


*https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing/index.html*

## Disinfection and Sanitization

182. To ensure a clean and safe destination for tourist arrivals, given the backdrop of the COVID pandemic, regular sanitization and disinfection of all common public areas and destinations is a must. The sanitization and cleaning of rooms, common public areas in hotels, restaurants, enclosed establishments, and open areas is of utmost importance. Disinfection of frequently touched surfaces—such as doorknobs, handles, bedsheets, and switches—should take place regularly. Sanitization and disinfection should be carried out with WHO recommended soaps and liquids.

Various technologies can be employed to automate the sanitization process and make it more efficient.

183. **Robotics.** The use of robots is ideal to automate the sanitization process while also ensuring minimum human interface. Hotels, restaurants, airports, and other open and enclosed establishments can employ robots for the automatic sanitization of areas. Robots can sanitize areas by spraying disinfectant or employ UV technology. Robots enabled with motion sensors require minimum or no human interface and can be managed via a device such as a laptop or mobile.

184. **Automatic touchless handwash and hand sanitizer dispensers.** One of the easiest yet most crucial precautions against COVID-19 is the washing and sanitizing of hands. By employing contactless hand sanitizer dispensers, regular cleaning or hand sanitization can take place eliminating any scope for human interface and thus limiting the spread of the virus. These dispensers use motion sensors to detect when a human hand is near and spray/release the sanitizer accordingly.

**Figure 24: BOX - TMiRob**

*The robot is designed to be used and deployed completely autonomously in areas of hospitals or even whole hospitals where infection control is of paramount importance.*

185. Shanghai's TMI Robotics has developed a robot that moves completely autonomously, fulfilling the task as preprogrammed with the layout and topography of the hospital or department. It will set off systematically disinfecting nearby air and all surfaces in any given area, and even return itself to a docking station when it requires a recharge.

186. The robot integrates three disinfection modes: ultraviolet, ultra-dry vaporized hydrogen peroxide, and air filtration to meet the demanding disinfection requirements in the healthcare sector. UV alone, at the optimal distance, can achieve 99.99% bacterial kill—including antibiotic-resistant

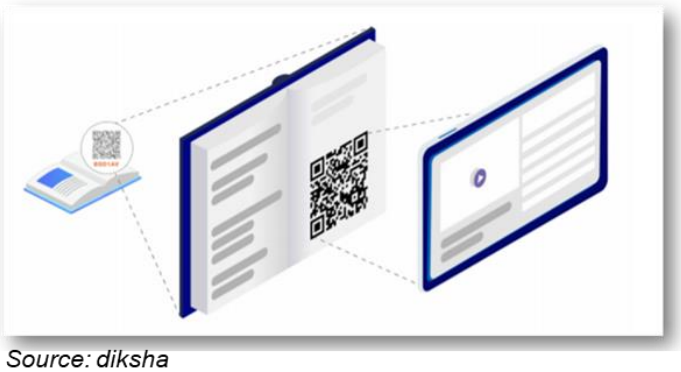
bacteria and viruses. When combined with air filtration, it forms a highly effective method of disinfecting and cleaning the surrounding air, in addition to achieving surface disinfection of surrounding walls, furniture, and fixings.

187. Any combination of these methods can be applied depending on the space or departmental rooms to be disinfected. The robot also automatically calculates the disinfection time according to the space and fixings and ensures no 'dead spots.'

188. **Digital learning.** Even before the pandemic, digital learning has been widely adopted across the world. Digital learning via video conferencing can be used for staff training and training for other backend operations by service providers. Digital learning platforms can be employed to communicate for COVID-19 related information and training. Universities and schools may use digital learning platforms to provide tourism-related training and run vocational and certificate programs via digital learning platforms.

189. **Virtual care platforms.** Given the severity of the COVID-19 pandemic, healthcare providers worldwide are struggling to keep up with demand and patient needs. It is thus increasingly essential for healthcare service providers to work in close coordination with technology service providers to leverage data and telehealth. Virtual healthcare platforms can greatly help in the diagnosis of COVID-19, clinical decision making, and managing manpower and hospital bed capacity. The use of technology to enable virtual care platforms can greatly help in shifting the burden away from hospitals and provide healthcare.

**Figure 25:Digital learning & QR Code**

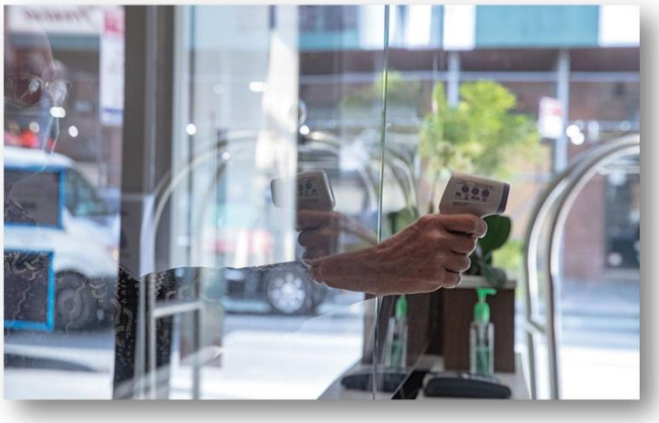


*Source: diksha*

MeCare or Mobile Enabled Care technology was developed by Philips. It allows chronically ill patients to track their daily health targets, manage symptoms, and use videoconferencing to connect with a clinical team each day.

190. **Temperature check: thermal scanner and cameras.** One of the most essential and crucial technologies required to counter the ongoing COVID pandemic is thermal scanning for a temperature check. Thermal scanning can be done via a handheld scanner or could be automated in combination with other technologies. Thermal cameras could be used to scan temperatures of individuals and groups, eliminating the need for human contact. Thermal scanners can be employed with AI and facial recognition technology, The AI technology enables the machine to conduct face detection, give alerts for a high or abnormal temperature, conduct mask recognition, and give alerts for isolation if required, through a 100% non-contact screening process.

Figure 26: Non-Contact Infrared Thermal Scanner



All service providers need to employ thermal scanners for checking temperature and maintaining safety standards.

# Suggested Safety Guidelines and Protocols

Chapter 4

# Chapter 4: Safety Guidelines and Protocols

191. As the world battles the COVID pandemic, many countries have issued guidelines applicable to all institutions, to improve safety and minimize the risk of viral spread. Since the tourism, hospitality, and aviation sectors are the worst hit, the ministries of tourism and civil aviation in many countries have issued special guidelines for various segments of these sectors. These guidelines, once implemented, are aimed at giving comfort and confidence to potential visitors that it is safe to travel to their country. In some countries, these guidelines are mandatory and supposed to be followed by everyone in the sector, and in other countries, they are optional, although highly recommended. This chapter includes recommended safety protocols based on protocols advocated and implemented by leading countries, considered to be pioneers in the tourism sector.

## Introduction

192. Detailed desk research has been carried out for global best practices, country guidelines, and guidelines by international agencies—such as UNWTO and WTTC—to understand the proposed safety and hygiene measures for the prevention and control of the COVID pandemic and to promote safe tourism destinations. Websites of the ministry of tourism of various countries like the USA, Portugal, UAE, UK, Germany, Belgium, Australia, and India have been reviewed thoroughly as these are the countries that are on top of using technological advancement to enhance and revive the tourism sector.

**'Clean and Safe' Seal**
**Turismo de Portugal**

Within the scope of the COVID pandemic, Turismo de Portugal created the 'Clean and Safe' seal to distinguish companies in the sector that comply with the minimum necessary measures of social distance, hygiene, and cleaning of establishments for the prevention and control of this virus or other possible infections. This was to allow tourism enterprises, tourist entertainment companies, and travel agencies to have a tool that certifies them as safe establishments, and thereby guaranteeing the tourist's confidence in the destination.

The requirements to be met by each agency and sector are made publicly available on the official website. After submitting a declaration of commitment to comply with all requirements, the applicant will receive a communication confirming their registration and the official stamp. The 'Clean and Safe' seal can be publicized physically on the premises and on their digital platforms. This seal with annual validity is free and voluntary. The establishments are observed for a consistent and effective maintenance of conditions.

These measures require the creation of an internal protocol, in conjunction with the recommendations of the Directorate-General for Health, which ensures the necessary hygiene to avoid risks of contagion and guarantees safe procedures for the operation of tourist activities.

*https://portugalcleanandsafe.com/en*

193. To improve safety and hygiene standards across the tourism value chain UNWTO and WTTC have issued guidelines and recommendations to assist different stakeholders to bounce back from the pandemic and instill confidence among tourists. These stakeholders include places of accommodation, restaurants, cafes, tour operators, tour guides, aviation services, transport services, and tourists.

194. This section includes the 'minimum safety requirement guidelines' distilled from the various country guidelines and guidelines by international agencies that define the minimum requirements to comply with for the promotion of safe and hygienic tourism in each tourism service provider sector.

195. These guidelines, specific to each tourism segment service provider for the use of technology to enhance safety and hygiene, can reinforce stakeholders in the CAREC countries.

The Azerbaijan Tourism Board (ATB), together with the State Tourism Agency (STA) of the Republic of Azerbaijan and in cooperation with the Food Safety Agency of the Republic of Azerbaijan (AQTA), has announced the launch of an innovative program called SAHMAN (Sanitation and Hygiene Methods and Norms).'SAHMAN,'—meaning 'immaculateness' in Azerbaijani—is a nationwide campaign set to transform Azerbaijan's existing health, safety, and hygiene standards. Supported by the UNWTO, it also reaffirms the country's commitment towards providing a world-class tourism destination for its citizens and future visitors alike in the post-pandemic world. Implementation will be carried out in four phases by: enroling in the program; participating in online (www.sahman.az) and onsite training and certification; labeling; and validation.
*Source: The Azerbaijan Tourism Board (ATB)*

## Minimum Safety Requirements

### Accommodation Services (Hoteliers/Airbnb/Guesthouse/Heritage Property)

**Minimum safety requirements for accommodation and service providers**

| | Safety and hygiene measure to comply with | Technology recommendation |
|---|---|---|
| **Training for all employees** | • All employees should receive information and/or specific training on internal rules related to the COVID pandemic and how to take basic precautions to prevent and control infection related to the virus.<br>• How to self-check daily for cough, fever, and difficulty in breathing; and how to comply with health guidelines for cleaning surfaces and dealing with clothing at the workplace. | Digital learning platforms may be adopted for the training of all employees. Digital learning via live or recorded video conferencing can also be used for staff training, learning, and other backend operations. |
| **Information to be provided to all customers** | • How to take basic precautions to prevent and control infection related to the COVID pandemic outbreak.<br>• Internal rules related to the COVID-19 virus outbreak. | |
| **The service organization ensures** | • There should always be an employee responsible for following the necessary procedures in the event of a suspected case.<br>• Following health recommendations, the isolation area should always be sanitized after a positive case of infection.<br>• The storage of waste products by those suspected of infection should be placed in plastic bags, labeled with ties, and then disposed of by a licensed provider.<br>• Daily self-assessment aimed at measuring fever, cough, and breathing difficulties. | A common curriculum may be prepared for staff members in the sector and the training may be conducted via digital learning platforms. |
| **The establishment ensures** | • Cleaning of all surfaces touched by people, clients, and staff.<br>• All surfaces liable to be touched (such as doorknobs) should be sanitized several times a day.<br>• Preference should be given to damp/wet cleaning.<br>• Enclosed offices and rooms are to be aired regularly.<br>• The disinfection of jacuzzi, spa, swimming pools, and so on should be carried out as per standard provisions. | Surfaces that are touched frequently by guests may be disinfected at least once every day with the help of automated disinfecting and sanitizing machines or sprays. Robots may be widely used for this purpose. |

| | | |
|---|---|---|
| | • Avoid direct handling of food by clients in dining areas. | Infrared thermal scanners and thermal cameras may be mandatorily utilized for temperature checks for guests as well as staff members. |
| **The establishment has** | • PPE kits in sufficient numbers for all employees and clients.<br>• Single-use cleaning material in stock proportional to requirements (wipes, sanitizers, bleach, and so on).<br>• Alcohol-based antiseptics at each floor near entry/exit.<br>• Non-manual waste collection bins.<br>• Liquid soaps and paper towels should be available in the toilets.<br>• A minimum of one room in which to isolate people suspected of the COVID pandemic with all desired items and non-perishable food. | |
| **Internal protocol for sanitation** | • The definition of specific care for changing bed linen and cleaning in the rooms is to be carried out in two stages with spaced intervals and adequate protection.<br>• The removal of bed linen and towel is to be performed without shaking it and avoiding contact with the body, taking it directly for washing.<br>• The washing of bed linen and uniforms should be done separately and at high temperatures (around 60°C). | |

## Food and Beverage Establishments

**Minimum safety requirements for restaurants and cafes**

| | | |
|---|---|---|
| **Training for all employees** | • All employees should receive information and/or specific training on internal rules related to the COVID pandemic and how to take basic precautions to prevent and control the infection related to the virus.<br>• How to self-check daily for cough, fever, and difficulty in breathing.<br>• How to comply with health guidelines for cleaning surfaces and dealing with clothing at the workplace.<br>• Stay home or leave work if sick; consult a doctor if sick and contact the supervisor. | Digital learning platforms may be adopted for the training of all employees. Digital learning via live or recorded videoconferencing can also be used for staff training, learning, and other backend operations. |
| **For employers** | • Pre-screen employees exposed to the COVID pandemic for temperature and other symptoms; instruct sick employees to stay | A common curriculum may be prepared for |

| | | |
|---|---|---|
| | home and send them home immediately if sick at work.<br>• Train employees on cleaning and disinfecting procedures and protective measures.<br>• Help educate employees and customers on the importance of social distancing through signs and audio messages and consider using every other check-out lane to aid distancing. | staff members in the sector and the training may be conducted via digital learning platforms. |
| **On food safety, cleaning, and sanitizing** | • Discard all out-of-date food items.<br>• Where salad bars and buffets are located, they must have a sneeze guard in place.<br>• Change, wash, and sanitize utensils regularly and place appropriate barriers in open areas.<br>• Cafeteria-style (worker-served) should be permissible with appropriate barriers and distancing in place; for 'takeaways,' the counter should be placed at an appropriate safety distance from customers with a sneeze guard in place.<br>• Ensure the person in charge monitors everything regarding food.<br>• Thoroughly detail-clean and sanitize the entire facility, especially if it has been closed.<br>• Regular cleaning of spaces (minimum: four daily cleanings).<br>• Avoid all food contact surfaces when using disinfectants.<br>• Make hand sanitizer readily available to guests.<br>• Consider touchless hand sanitizing solutions.<br>• Single-use items should be discarded.<br>• Regularly clean and sanitize menus or preferably use a digital platform for the order.<br>• Check restrooms regularly and clean and sanitize them based on frequency of use. | Surfaces that are touched frequently by guests in establishments may be disinfected at least two or three times every day with the help of automated disinfecting and sanitizing machines or sprays. This may depend upon the frequency of guests and peak durations. Robots may be widely used for this purpose.<br><br>Big data analytics may be utilized to keep track of the inventories for food and perishable products available in the establishment. |
| **If an employee becomes ill or presents signs of illness** | Monitoring employee health.<br>• Employees who are sick should stay at home.<br>• The operator should identify signs during a pre-work screening.<br>• The employee should self-isolate for seven days from the onset of symptoms and be symptom-free for three days without medication.<br>• Taking employee temperatures is at the operator's discretion.<br>• Use of hand sanitizers with at least 60% alcohol content.<br>• Coverings or dresses worn by employees should be kept clean. | Infrared thermal scanners and thermal cameras may be mandatorily utilized for temperature checks for guests as well as staff members.<br><br>Automated robotic sanitization machines may be utilized for |

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| | | disinfection and sanitization. |
| **On social distancing** | • No one with a fever or symptoms of the COVID pandemic should be permitted entry.<br>• Provide hand sanitizer for guests to use, including contactless hand sanitizing stations.<br>• Try not to allow guests to congregate in waiting areas or bar areas.<br>• With larger staffs, use communication boards or digital messaging to convey pre-shift meeting information.<br>• Use technology solutions where possible to reduce person-to-person interaction. | AI and IoT may be utilized for crowd control and social distancing through technology.<br><br>By placing mobile operated sensors or cameras enabled with computer vision technology or geofence technology evenly across the food and drink establishments can keep track of the movement of the crowd and manage and direct accordingly. |

## Transport Services (Private and Public)

**Minimum safety requirements for transport service providers**

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| **Training for all employees** | • All employees related to public transport and taxis should receive information and/or specific training on internal rules related to the COVID pandemic virus and how to take basic precautions to prevent and control infection related to the virus.<br>• How to self-check daily for cough, fever, and difficulty in breathing.<br>• How to comply with health guidelines for cleaning vehicles. | Digital learning platforms may be adopted for the training of all employees. Digital learning via live or recorded videoconferencing can also be used for staff training and learning. |
| **Travel preparedness** | • It is required to develop an inventory of staff qualifications, licenses, and so on to identify employees who could act as a backup for critical positions.<br>• A review of the stock and availability of essential protection and cleaning equipment should be carried out.<br>• A review of stock and supply chains for operational material, such as fuel, lubricants, or spare parts, should be carried out. | Digital learning platforms may be adopted for the training of all employees. Digital learning via live or recorded videoconferencing can also be used for staff training and learning. |

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| | • Follow related communications of the responsible authorities to stay informed about the latest advice at local level. | |
| **Personal protection (traveler and staff) and reduction of contact** | • Staff washrooms and dressing rooms, meeting rooms, and offices should be equipped with hand disinfectants and paper tissues.<br>• Drivers and assistant staff should wear masks and PPE kits throughout the journey.<br>• After every trip, all surfaces contacted by people or staff should be cleaned and sanitized.<br>• Staff that have to tend sick travelers, clean bodily fluids, or clean potentially contaminated items and surfaces should wear disposable gloves.<br>• Wet cleaning in preference to dry cleaning or vacuuming.<br>• The traveler should use the monthly pass, online ticketing, and mobile apps to book tickets where possible.<br>• The vehicle and stops should provide signage, floor markings, and announcements via the public address (PA) system to encourage social distancing.<br>• Self-sanitizing technology may also be considered for integration within kiosk touchscreens.<br><br>**Reduction of contact**<br><br>• Customer service staff should be available in information booths or desks only with sufficient distance from passengers.<br>• Rear door boarding should temporarily replace the front door access of buses, to protect drivers that have no separate cabins.<br>• Online ticketing or ticketing through mobile applications should be promoted with discounts.<br>• Support handles for standing passengers should be removed from vehicles.<br>• A strictly regulated number (50% of seats) of passengers should be allowed inside the vehicle with social distancing norms.<br>• Doors should be replaced with automated entry/exit doors. | Automated robotic sanitization machines may be utilized for disinfection and sanitization<br><br>QR code-based tickets/monthly passes may be utilized for journeys.<br><br>AI and IoT may be utilized for crowd control and social distancing through technology.<br><br>By placing mobile operated sensors or cameras enabled with computer vision technology evenly across transport services/vehicles can keep track of the movement of the crowd, manage, and direct accordingly. This can also be used to ensure the optimal number of people in a vehicle during rush hour. |
| **Requirements for taxis** | • Companies or owners should provide necessary safety kits such as masks, sanitizers, and disinfectants to drivers. | Robotic automated sanitization machines may be utilized for |

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| | • Drivers should sanitize their cars after every trip using the supplies.<br>• Air conditioners in cars should be turned off to prevent air circulating between the passenger and the driver.<br>• Maximum of two passengers in a car.<br>• Only cashless transactions allowed for rides.<br>• Panels or isolators should be considered to separate passengers from the driver.<br>• No passenger is allowed to sit in the co-driver seat in front.<br>• Repeated failure to comply with the requirement can lead to account deactivation for both riders and drivers. | disinfection and sanitization.<br><br>Cashless payments may be done by various technological advancements such as QR code-based payments, UPI, NFC payments, SMS based payments, and prepaid digital cards. |

## Travel and Tour Operators

**Minimum safety requirements for travel and tour operators**

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| **Training for all employees** | • All employees should receive information and/or specific training on internal rules related to the COVID pandemic and how to take basic precautions to prevent and control infection related to the virus.<br>• How to self-check daily for cough, fever, and difficulty in breathing; and how to comply with health guidelines for cleaning surfaces and dealing with clothing at the workplace. II.<br><br>Information to all customers.<br>• Information should be provided to all customers on how to take basic precautions to prevent and control infection related to the COVID pandemic outbreak and internal rules related to the COVID pandemic outbreak. | Digital learning platforms may be adopted for the training of all employees in the transport services sector. Digital learning via live or recorded video conferencing can also be used for staff training and learning.<br><br>A common curriculum may be prepared for staff members in the sector and the training may be conducted via digital learning platforms. |
| **The service organization ensures** | • Observance of the maximum permitted occupation per square meterage of enclosed space.<br>• Maintenance of social distancing.<br>• Observance of the maximum permitted occupation of means of transport used in business.<br>• Compliance with internal health and safety rules. | AI and IoT may be utilized for crowd control and social distancing through technology.<br><br>By placing sensors or cameras enabled with computer vision technology evenly across the transport |

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| | • There should always be an employee responsible for following the necessary procedures in the event of a suspected case.<br>• Decontamination of the isolation area whenever there are positive cases of infection.<br>• Storage of waste products by those suspected of infection should be placed in plastic bags, labeled, and then disposed of by a licensed provider. | services/vehicles can keep track of the movement of the crowd, manage and direct accordingly. |
| **The company ensures** | • Washing and disinfection, following internal rules of areas where employees and customers circulate.<br>• Cleaning several times, a day of areas and objects in general use (furniture, and so on).<br>• Wet cleaning in preference to dry cleaning or vacuum.<br>• Enclosed rooms to be aired regularly.<br>• Avoid direct handling of food by customers and clients in eating areas. | Robotic automated sanitization machines may be utilized for disinfection and sanitization. |
| **The company has** | • PPE kits in sufficient numbers for all employees in business activities.<br>• Individual protective equipment is available to customers.<br>• Single-use cleaning material in stock proportional to requirements (wipes, sanitizers, bleach, and so on).<br>• Alcohol-based antiseptics at each floor near entry/exit and wherever required.<br>• Pedal-operated waste bins with plastic liners.<br>• Equipment for handwashing with liquid soap and paper towels in WCs. | Contactless hand sanitizing via automated sanitizers using robotics technology may be utilized.<br><br>A digital database may be developed through big data to keep track of the inventory of all the essential items such as PPE kits, masks, sanitizers, and so on. |
| **Internal protocol for sanitation** | • High temperature (60°C) washing of cloakroom and other accessories provided, used by customers and employees.<br>• Provision of alcohol-based hand disinfectant dispensers, wherever necessary.<br>• Cleaning and disinfection of means of transport and equipment used, after every activity following the rules. | AI and biometric-enabled facial recognition may be utilized to ensure all the service providers and users are wearing masks. |

**Minimum safety requirements for the airports and aviation sector**

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| **Terminal building** | • Cleaning and disinfection of terminal infrastructure and all equipment should be done regularly, and its frequency should be increased as required owing to traffic.<br>• Ensure all cleaning and disinfection staff are aware of the cleaning and disinfection plan.<br>• Social distancing is a must.<br>• Employees should be equipped with PPE based on the risk of exposure (type of activity) and the transmission dynamics.<br>• For staff training, maximize the use of online training and virtual classrooms.<br>• Prioritize and adjust the scheduling of all maintenance and repair work in public areas.<br>• Possibly postpone non-essential work. | Automated sanitization and cleaning of common public areas and surfaces where travelers and staff have often visited may be disinfected and sanitized via robots and UV lights.<br><br>Digital learning platforms may be adopted for the training of all employees in the aviation sector. |
| **Check-in Area** | • Implement measures should be done to reduce congestion within these areas through advanced-planning and monitoring of passenger flows.<br>• Airports should provide signage, floor markings, and announcements via the Public Address (PA) system to encourage social distancing.<br>• Whenever possible, passengers should be encouraged to complete check-in processes before arriving at the airport.<br>• At traditional check-in counters, use retractable stanchions and floor signage in the queuing area.<br>• Self-sanitizing technology may also be considered for integration within kiosk touchscreens. | AI and IoT may be utilized for crowd control through technology.<br><br>Contactless entry/exit with smart gates, self-check-in, security check-in, and cashless payments may be done via a combination of AI and biometric technology.<br><br>Temperature checks may be done through digital thermometers, handheld thermal scanners, or thermal cameras for mass or individual scanning. |
| **Security and screening** | • Non-contact thermometers should be used in a designated area for first level screening.<br>• Procedures should be implemented in coordination with the relevant authority to respond to any passengers who show signs of illness.<br>• Provide hand sanitizers and disinfection products before passengers and staff screening access points where possible.<br>• Screeners and passengers should maintain social distancing or wear PPE kits.<br>• Rearranging of security checkpoint access and layouts. | Automated sanitization and cleaning of common public areas and surfaces where travelers and staff have contacted may be disinfected and sanitized via robots and UV lights. |

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| | • Automated gates and mobile scanner reader surfaces should be disinfected with the same frequency as for any other high-touch surface.<br>• Routine enhanced cleaning and disinfecting should be conducted.<br>• Passenger preparation officers should be deployed to ensure passengers are prepared for the divestment requirements. | |
| **Terminal airside area** | • Self-service options should be done where passengers have limited contact with retail, food, and beverage staff.<br>• An orderly boarding process should be necessary to reduce physical contact between passengers.<br>• Implementation of self-boarding technologies at the gate should be considered; sitting areas can open at limited capacity to accommodate the short-term need for social distancing.<br>• Self-scanning of documents should be encouraged when identification is required; hand sanitizers should be provided at multiple points in the area.<br>• Touch-free equipment should be installed in toilet facilities. | Self-order kiosks or QR code menus may be developed which will enable the immediate contactless system for food services. These can be done through mobile applications or digital touchless menus.<br><br>Digital immigration services with the use of QR code technology, SmartGates, digital stamping, and so on may be adopted for self-boarding and self-scanning of documents. |
| **Baggage claim and exit** | • Maximize the use of available arrival baggage carousels to limit the gathering of passengers.<br>• Governments should ensure that the customs clearance process is as speedy as possible.<br>• Allow for a self-service kiosk or online options for passenger services.<br>• Encourage the use of baggage delivery services (if possible).<br>• Share baggage tracking information with passengers.<br>• Establish a protocol for cleaning and disinfection of the area.<br>• Provide multiple handwashing stations or hand sanitizers before the exit of the terminal building.<br>• Increase cleaning based on flight schedules. | Automated baggage tracking and handling software may be utilized at airports by airlines.<br><br>Automated sanitization and cleaning of common public areas and surfaces where travelers and staff have contacted may be disinfected and sanitized via robots and UV lights. |

**Minimum safety requirements for tour guides**

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| **Training for all employees** | • Gain information and training on health and hygiene risk prevention guidelines in the activity.<br>• Avoid greeting other tour guides, providers, and visitors with physical contact, including shaking hands. Safe distances must be respected whenever possible.<br>• If the tour guide experiences any symptoms of the disease, even if they are mild, they should refrain from providing the service.<br>• Wear a mask (or protective shield) whenever the safe distance cannot be guaranteed and encourage clients to wear them in these cases too. Where a mask is used, dispose of it according to the manufacturer's instructions and its life span. Where a protective screen or reusable mask is used, it must be properly disinfected after each use.<br>• Immediately throw away any personal hygiene waste—especially tissues—including PPE in authorized waste bins or containers.<br>• Wash hands frequently with soap and water or, when this is not possible, use hand sanitizer.<br>• This is especially important after coughing or sneezing, and after touching potentially contaminated surfaces (doorknobs, railings, lifts, and so on).<br>• Disinfect personal items (glasses, mobile phones, microphones, and so on) frequently with soap and water and, if this is not possible, with a disinfectant solution. Use specific products applied with a cloth, or special disinfectant wipes, to disinfect electronic equipment.<br>• Avoid sharing work equipment or devices with other tour guides as much as possible. If certain equipment or devices are shared (talkies, radio guides, phones, umbrellas, and so on), the tour guide must establish cleaning and disinfection guidelines and, failing this, use PPE to reduce the risk of contagion. | Digital learning may be adopted for the training of tour guides and site managers. Digital learning via video conferencing can also be used.<br><br>A common curriculum may be prepared for tour managers and guides and train or teach through digital mobile or e-learning options.<br><br>Big data technology may be utilized to register all tour guides and managers under the same platform.<br><br>Digital infrared thermometers may be utilized for regular temperature checks of all tour guides. |
| **The tour guide must follow these preventive measures when designing activities** | • Determine how the visit will be conducted and where the tour will go based on the risk assessment and the regulations and/or possible restrictions applied by service providers (museums, monuments, natural areas, and so on).<br>• Prepare one-way routes to avoid groups crossing whenever possible (small towns, historical centers), coordinating in any case with other tour guides. | AI and IoT may be utilized for crowd control and social distancing through technology. Sensors or cameras enabled with computer vision |

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| | • Avoid areas likely to be crowded.<br>• Avoid small spaces with limited capacity.<br>• Wherever feasible, a single point should be established for getting on and off the vehicle in cities with more tourism to facilitate information, application of health and hygiene regulations, and control application. This point should be agreed upon with the competent administration.<br>• Walking tours and stops for explaining monuments must be done in open and/or wide spaces, respecting the safe distance.<br>• A maximum number of people to whom the service can be offered safely should be established. If tour guides use their vehicle to transport tourists (always with the required license), they must follow the guidelines set by health authorities.<br>• The tour guide should ask providers used to contract a service (such as accommodation, restaurant, coaches, museums, monuments, and visitor centers) for the application protocol for the prevention of health and hygiene risks concerning the COVID pandemic. | technology may be utilized to keep a track of the movement of the tourist crowd, manage and direct accordingly. Tour guides may use the technology to manage the number of tourists at a particular site.<br><br>A digital payment platform like Google Pay may be developed for them to avoid direct contact and decrease the use of physical currency. |
| **Cleaning requirements: the tour guide should consider the following aspects in terms of cleaning and disinfection** | • Using authorized disinfectant cleaning products safely and according to product safety data sheets.<br>• Increasing cleaning frequencies, especially in areas of greatest contact.<br>• As a general rule, all materials used during the service must be disinfected at the end of the service.<br>• Client voice reception systems (headphones, whispers, and so on) that are not single use must always be disinfected at the end of the service and, in any case, before being used by another person.<br>• If contact is required, the POS must be disinfected after each use.<br>• If the tour guide uses their vehicle to transport tourists, it must be fully disinfected at the end of the service and daily for multi-day services. | Digital automated sanitization machines may be utilized for disinfection and sanitization of vehicles and public areas by site managers. The frequency of disinfection may depend upon the frequency of visitor groups.<br><br>Virtual assistance technology such as chatbots, virtual tour guides, and so on may be adopted for safe and secure tour guide services. |

# Survey Findings

## Chapter 5

# Chapter 5: Survey Findings

## Survey Design

196. Questionnaires were designed for representatives from each segment of the tourism industry, using Google Forms and Qualtrics. Using Google Forms allows us to easily launch the online survey, compile, and collate all the survey data.

197. The CAREC region comprises countries with diverse characteristics. These countries have dissimilar sizes of population and economy. The tourism infrastructure of each country is unique and attracts varying numbers and types of tourist. The purpose of the survey is to get a rapid assessment of the existing tourism sector. This assessment enables a broad profiling of each country to suggest 'appropriate' recommendations for technology adoption specific to the country. Assessment is not intended to make estimations of the tourism sector or the extent of the impact made by the pandemic. The questionnaires were aimed at helping to gauge the extent of technology adoption across different segments of the tourism sector—such as accommodation providers, food establishments, and travel agents. They also helped in identifying the issues and challenges currently faced by the respective tourism segments owing to the pandemic and the support that they expect to receive from their government for technology adoption.


198. None of the CAREC countries have a reliable and comprehensive database of different tourism segments, so the total number of players—such as hotels, guesthouses, and travel guides—is not known. Neither do past trends of tourist numbers and source markets provide a clear forecast, since the recovery of previous tourist traffic will depend upon a host of factors, many of which are outside the destination country's control.

199. Given this background, it was neither feasible nor necessary to prepare a detailed sampling design for the primary survey. Fixing sample sizes for each country was impractical, given that a) there are no ways to ensure the number of planned responses that can be gathered and b) the actual responses were used only to get a broad assessment of the current situation, not to make any economic estimates. The summary report prepared after the survey data compilation indicates the exact number of responses received from each segment within each country. Possible non-responses from a specific segment/country are also mentioned.

200. The different groups of stakeholder, both on the demand and the supply side of the tourism industry, which were covered by the primary survey, are listed as follows:

- **Tourists/travelers.** This section of the survey aims to understand the demand side of the tourism industry for the CAREC region. This allows us to gauge the key concerns and impediments to traveling, as identified by potential tourists themselves, along with the current usage of technology—such as GPS navigation, and online payments and bookings.

- **Accommodation services (hoteliers/Airbnb/guesthouse/heritage property).** This questionnaire has been designed for accommodation services to understand the overall impact of the COVID pandemic on the businesses of the accommodation services and how technology can aid the recovery process. The questionnaire assesses the existing use of technology in accommodation services—for instance, room bookings and check-in process. Given the background of the pandemic, the survey covers the precautionary measures being adopted to avoid the spread of the virus and the role of technology in aiding the same.

- **Food and beverage establishments (restaurants/bars/pubs/cafes).** This questionnaire seeks to understand the impact of the pandemic on the businesses of restaurants, bars, cafes, food courts, and so on. The questionnaire assesses the existing use of technology in the foods and beverage establishments as precautionary measures to improve health, hygiene, and safety. For instance, questions about the usage of online payments and booking options enabled by technology were covered in the survey. It was designed to understand the current use of technology and forecast potential use.

- **Transport services (private and public).** This questionnaire covers both public and private transport service providers, such as taxi and bus operators, train operators, and booking agents. The questionnaire assesses the current use of technology for services such as online ticketing and general information. The questionnaire also seeks to assess the impact of the COVID pandemic on transport services and how technology can aid the preventive measures.

- **Travel and tour operators.** This questionnaire is aimed at travel and tour operators who provide a multitude of services ranging from booking tickets and hotels, booking local taxis, buying tickets for local events and venues, arranging for guides and translation services, and so on. The survey assesses the existing role of technology within the work scope of tour operators and its futuristic scope, the impact of the COVID pandemic on tour operator businesses. The survey also seeks to identify precautionary measures taken for the COVID pandemic and the role of technology in adapting to the same.

- **Airline services (domestic and international airlines/airports)** are severely hit by the pandemic; these services are considered hotspots for the spread of the COVID pandemic. Existing technology plays an important role in enabling these services, but the post-pandemic era has a lot more potential. This questionnaire seeks to understand the use of technology not only in enabling general services but also in precautionary COVID pandemic measures. Some of the adopted measures include contactless immigration, socially distanced baggage pickup, on-tap information, and automated sanitization.

- **Tour guides and tourism site managers.** This questionnaire assesses the availability of local guides and facilities available for interpretation and translation services in respective countries. Collecting information from tour guides and site managers helps in the assessment of the adoption of technology at key tourist sites for ticket bookings, interpretation, crowd control, and so on. These services are a critical link between tourists

and local communities and often influence the choice of venues for sightseeing, shopping, food, and so on.

- **Software and technology providers:** This section of the survey aims at gauging the role, current status, and availability of local ICT products and services to serve the tourism industry. These providers are key players for the study as they help in understanding the current situation of technology, availability, and its scope in the near future in respective CAREC countries. Technology has been the backbone of the COVID pandemic response for various industries; this study aims at harnessing technology for tourism.

201. The consultant, through the offices of ADB and CI, identified representative bodies for each segment and promoted these questionnaires extensively to elicit an adequate response from all member countries.

202. The designed questionnaires were translated into bilingual online forms. For clarification, while the questions and multiple-choice answers are displayed in two languages, all responses are captured only in English.

203. After the pilot survey, the technical issues or points were improved, and questions were rephrased or reframed based upon the respondents' responses. This refinement led to a better quality of response to the survey.

## Survey Results

204. This segment provides the results and key findings of the primary survey carried out using a combination of Google Forms and Qualtrics. The online survey title *Revival of the Tourism Sector in CAREC Region: Harnessing the Role of Technology in Promoting Safe Tourism Destinations* was carried out during October and November 2020. This includes the survey findings for both the demand side—tourists—and the supply side—tourism service providers. The detailed overview of the survey results is included in Annexure A.

205. Despite best efforts by the consultant, ADB, and CI to promote the survey through direct contacts as well as through national focal points, the response was very limited. The study promoted the questionnaires extensively through digital media to elicit a high response from the target representative bodies for each segment in all member countries. In addition, a huge number of email addresses of tourism and travel firms were collected, and more than 900 emails were sent. The survey link was also promoted through various social media platforms such as WhatsApp, Viber, WeChat, Telegram, Messenger, Facebook, LinkedIn, and Instagram, in the form of public posts and personal messages. The CI's Director sent letters to the designated national focal persons from all the CAREC countries, requesting them to distribute the survey link among their networks.

206. The study received 176 responses to the survey. Of the total responses, about 61% were the service provider representatives in the CAREC region and the remaining 39% were tourism professionals and tourists from around the world visiting the CAREC region. The survey coincided with the early phase of relaxation of the global travel restrictions. Understandably, the private sector service providers, who were the target group for the survey, were focused on getting their business going after a considerable period of lockdown and therefore were not too eager to participate in the survey. **However, despite the small sample size, the findings of the survey study were found to be in complete alignment with the suggestions and comments received during focus group meetings and panel discussions**.

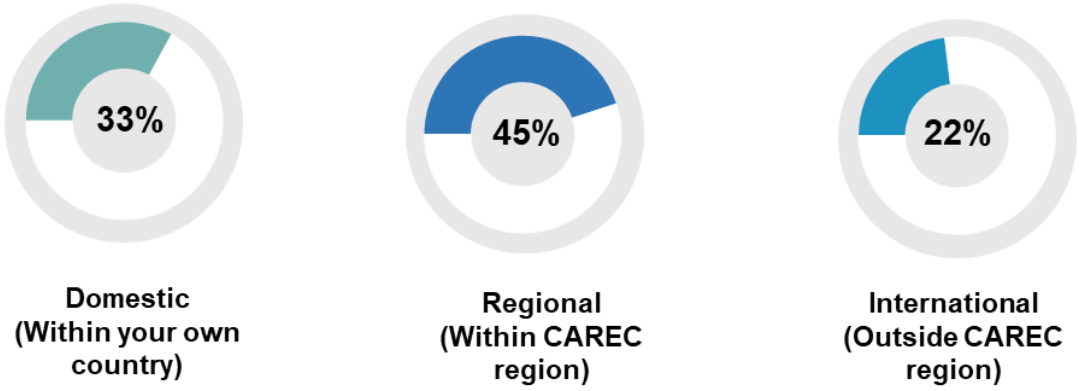
## Survey Findings—Demand Side: Tourist/Potential Traveller

207. One of the key lessons learned from the survey is that there has to be a compelling reason for people to participate, such as the ministry of tourism (of the respective country) itself promoting the survey or the survey responses automatically leading to registration with some government scheme or incentive. Without such a compelling reason, most respondents are reluctant to devote time to surveys.

**Figure 27: Have traveled already or plan to travel to the CAREC countries ?**

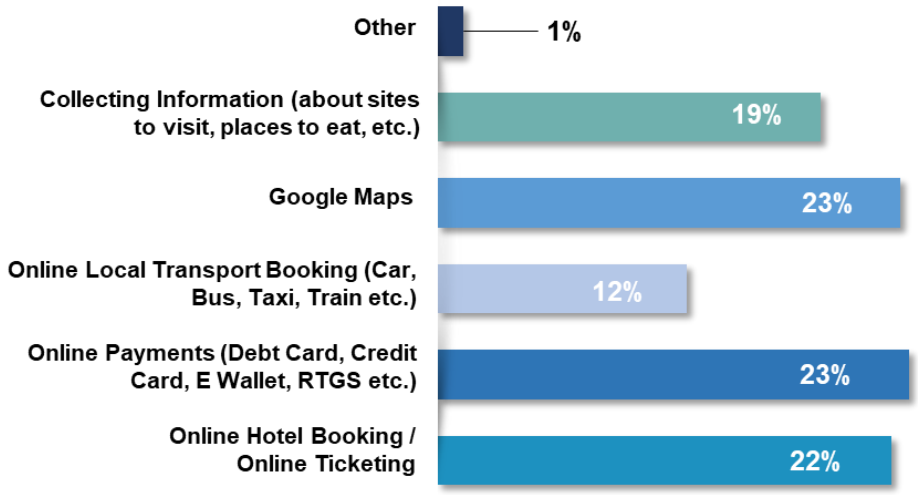

**With 26% of prospective tourists planning to travel to CAREC countries in the near future, 2021 can look forward to a recovery.** Only 9% of respondents had already traveled to CAREC countries before the COVID pandemic.

**Figure 28: Where are you planning to travel in 2021?**



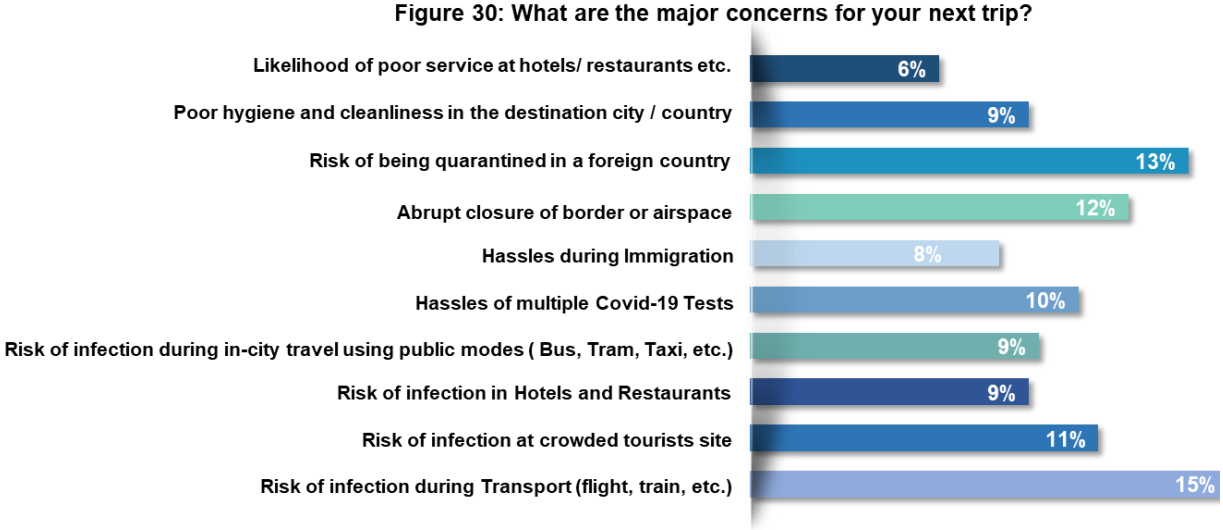

Of respondents from the CAREC region, **78% plan to travel within the CAREC region—that is, 45% are planning to travel regionally (within the CAREC region) and 33% are planning to travel domestically (within their respective country).** This further reinforces the commonly held belief that domestic and regional tourism in the CAREC region will pick up first, before international tourism.

Figure 29: What do you use internet for during your travel?




**57% of respondents confirmed using online platforms** for various purposes—such as, booking hotel services (22%), transport services (12%), and making online payments (23%) for the services. At the same time, 42% of respondents used the internet for gathering information before and during their journey, predominantly Google Maps for directions (23%) and other sources for deciding destinations and places to visit (19%). This shows that technology already plays a crucial role in the tourist's journey.

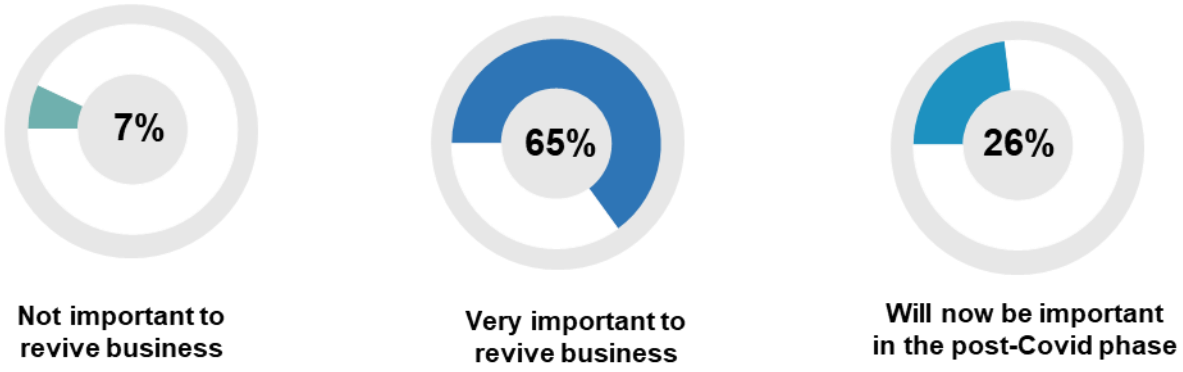
Figure 30: What are the major concerns for your next trip?




**The major concern raised by 44% of respondents was the risk of infection** either during long-distance travel (15%), in-city travel (9%), during their time at the hotel or restaurant (9%), or while visiting crowded tourist sites (11%). **For 25%, the biggest fear was the risk of being quarantined in a foreign country (13%) or abrupt closure of borders or airspace (12%).**

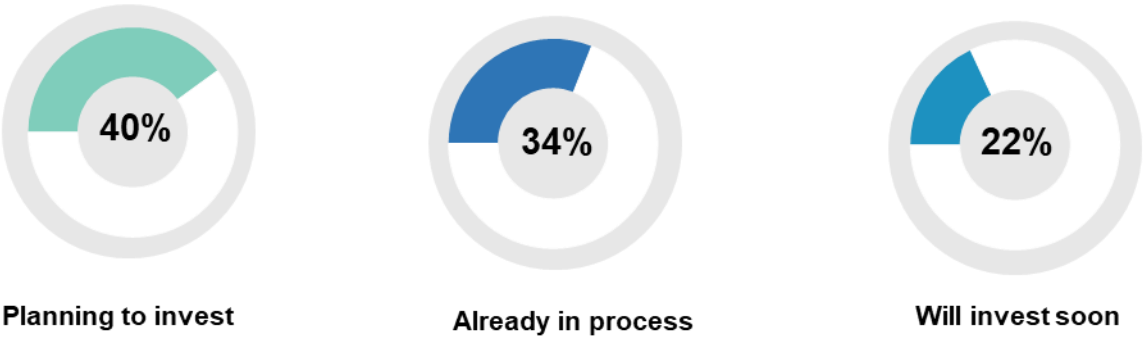
## Survey Findings—Supply Side: Tourism Service Providers

**Figure 31: How important is technology to revive your business?**




**Over 90% of service providers believe that adopting technology will greatly help in the revival of their business in the post-COVID phase,** with 65% considering technology adoption to be very important in reviving their business.

**Figure 32: Are you considering investing in technology?**




**34% of service providers are already in the process of investing in technology.** It is also worth noting that **62% of service providers plan to invest in technology** soon (22%) or are considering investing (40%) in the future.

Figure 33: What support do you need from the government in order to adopt technology?

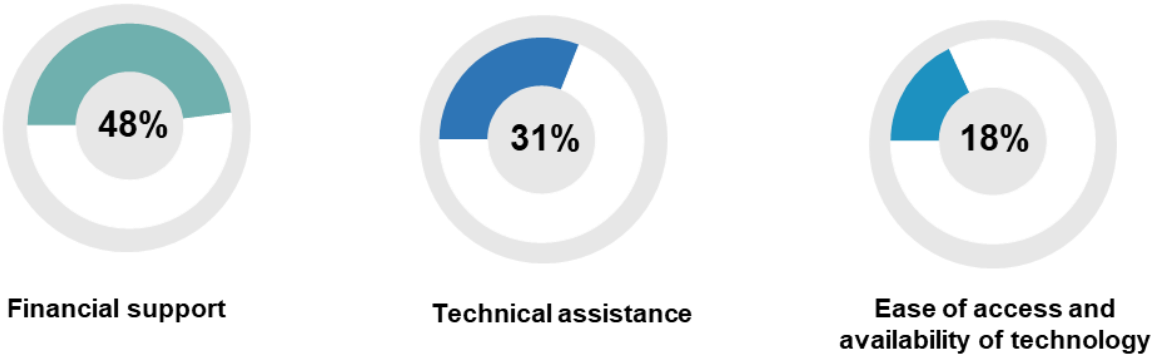
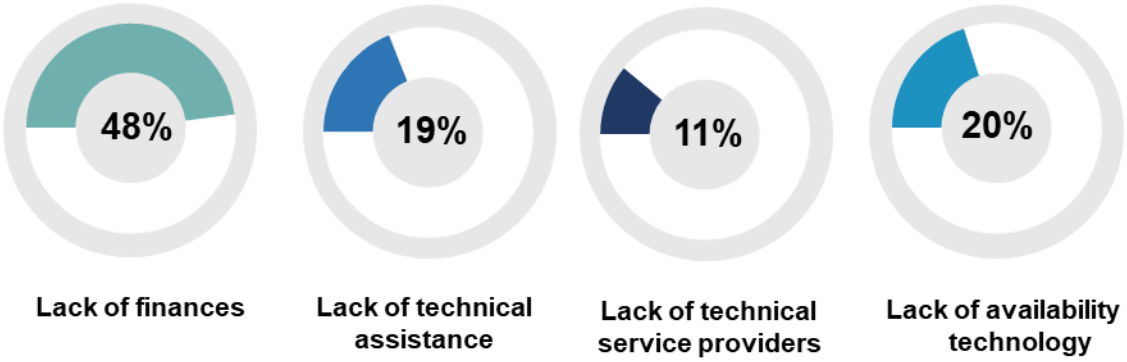
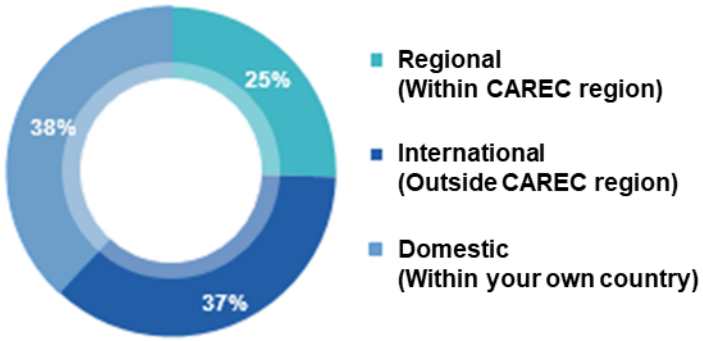



Figure 34: What are the main barriers in adopting technology?




**48% of service providers cite lack of finances as the main barrier to the adoption of technology** and they expect certain financial assistance from respective governments. Further, it is interesting to note that **49% expect technical assistance (31%) and support for access to local technology (18%) from the government.** This shows that mere financial ability is not sufficient to adopt the technology, it is equally important to consider improving the access and availability of local ICT technical support and infrastructure.

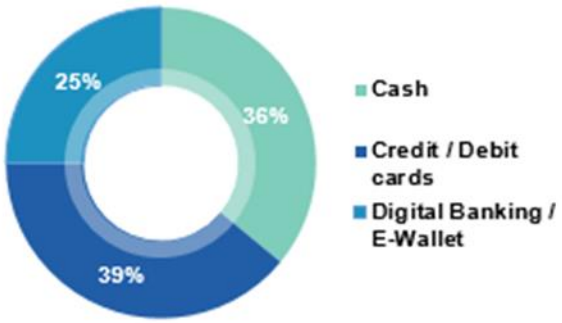
Figure 35: What is the primary customer source for your business?




Although 62% of service providers primarily receive tourists from international destinations, including 25% of those from the CAREC region, 38% of services providers depend on tourists

from domestic markets. Given the current scenario of the COVID pandemic and cross-border restrictions, catering to domestic tourists will be a key step in the revival of the tourism sector.

**Figure 36: How do visitors generally pay for your tourism services?**




**75% of service providers receive digital payment** via credit cards, digital banking, or e-payment methods. This further strengthens the need for the adoption of technology for various purposes, including digital payments.

# Recommendations

Chapter 6

# Chapter 6: Recommendations

## Recommendations for CAREC Countries

208. This chapter provides recommendations about how countries in the CAREC region can use technology to provide clean and safe tourism destinations by raising standards of cleanliness, hygiene, and safety to ensure that tourists feel confident and are enthused to travel from outside and within the region. Many of these recommendations will also help the sector become more efficient, profitable, and sustainable, thereby raising its resilience and helping it recover from the devastating effects of the current global pandemic. These recommendations are informed by a variety of ground-level evidence (such as the survey); feedback and suggestions from tourism industry experts from CAREC and elsewhere; reports, whitepapers, and documentaries about the latest use of technology in the tourism sector; and guidelines, protocols, and global best practices followed and recommended by leading tourist countries around the globe. This wide variety of inputs has helped the Study to address the problem, answer questions, and gather views on the current state of technology in the tourism industry and to prepare for the path forward. The Study attempts to answer the following fundamental questions:

209. **Is technology important for tourism development in CAREC countries and destinations?**

It is universally acknowledged by tourism experts and our research confirms that technology plays a critical role in not just the revival but also the growth of the tourism industry. Technology has been transforming the tourism industry around the world. The adoption of technology is relevant to the tourism industry as on the demand side, it empowers tourists to recognize, configure, and buy tourism products and services before, during, and after every travel journey. The extensive use of technology has contributed to the increased exposure to information. The richness of information available has radically altered tourist behavior and considerably increased tourist expectations. While on the supply side, technical advancements are playing a critical role in the competitiveness of tourism organizations and destinations, and by creating resources for designing, handling, and distributing tourism product offerings globally.

Rapid advances in technology capabilities coupled with a reduction in ICT costs and increased efficiency, usability, and interconnectivity of devices and applications contribute to tremendous improvements in the tourism industry's operations. As the global trend towards more independent travel grows, there is higher demand for flexible, customized tourism options, all of which is simply not possible without the extensive use of technology.

210. **Whether and to what extent are these technologies particularly relevant for the COVID and post-COVID periods?**

The need to reassure visitors about their safety and wellbeing has never been greater—indeed critical—as now, owing to the pandemic. Without being reasonably well assured that s/he would be safe at all stages during the trip, the visitor will simply not make the trip. The technologies mentioned in the report are in use with regard to their role in minimizing the human interface and promoting safe and clean tourism.

Technology can help in three main areas during the COVID period:

- Building trust and confidence among prospective travelers that they would not only be safe during their trip, but if they faced any issues or had queries, they would have ready availability of the required information.
- Ensuring that tourists stay safe at all times during their trip—during the flights, immigration control, hotel checking in, local journeys, while visiting public and tourist places, and going out to eat and shop. Technology can not only make it easier for tourism service providers to implement the safety protocols for screening, sanitization, safe distancing, and containment of risk areas, it can make this data available to tourists so s/he can avoid areas of potential risk, further reinforcing a sense of safety and wellbeing.
- Helping achieve the seemingly contradictory goals of reducing the human interface while providing a richer and more immersive experience through the use of technologies such as VR and AR, online shopping from local markets, and participating in cultural events (such as, music concerts, dance and drama shows, and so on) in a safe and comfortable manner.

A section discussing the role of technology specifically in promoting clean and safe tourism and maintaining COVID pandemic precautions is discussed in detail in Chapter 3 of the report. The technologies are listed keeping COVID pandemic-related protocols in mind to address the immediate concerns of travelers.
In the post-COVID era, the deployed technological advancements will aid in reviving the tourism business, improving the performance of operations, and help in providing better levels of service to tourists.

211. **How is this use of technology relevant for the CAREC region?**

The benefits of the use of technology are universal, so there is no reason why certain global best practices, if they have worked elsewhere, will not also work in the CAREC region. However, different CAREC countries are at different stages of ICT development and therefore their adoptive and absorptive capacity to implement the latest technologies is constrained by the local availability of a) basic ICT infrastructure—especially mobile and internet connectivity—and b) IT support service firms that can provide the required technical support for installing, maintaining, and troubleshooting various technology solutions. The better individual countries do on these two criteria, the more sophisticated applications they can adopt.

CAREC is a heterogeneous region, both from the point of overall development, as well as from the level of technology adoption. There are significant differences in level of ICT infrastructure and usage between different CAREC countries. At one end of the spectrum are countries such as Georgia, Azerbaijan, and Kazakhstan, which have a reasonably well-developed basic ICT infrastructure in place (although still nowhere near the level of more developed countries like Spain, Italy, or France); at the other end of the spectrum countries such as Pakistan, Tajikistan, Turkmenistan, and Afghanistan have relatively poor ICT infrastructure. Technology implementation is possible only when all the required components of the technology ecosystem—hardware, software, maintenance, and technical support services—are present. While it is theoretically possible to 'buy' technology from anywhere in the world, business enterprises, even if they have compelling reasons to do so, do not invest in technology upgrades unless the entire supporting ecosystem is available. The good news is that countries which lag behind in ICT readiness can, given the political will, quickly 'leapfrog' directly to the most advanced technologies, without going through the painful journey of transitioning from outdated and old technologies to newer ones.

212. **What is the role for government in technology adoption versus private sector actors?**

In response to the pandemic, governments around the globe have responded with varying degrees of alacrity and stringency. Many examples of good practices already exist. Countries at the forefront of the tourism industry, such as Portugal, Spain, and Italy, have attempted to restart tourism activities by introducing guidelines that put tourist safety first, and provide specific guidelines to manage destinations and private establishments in a responsible and coordinated manner. For instance, the Portuguese National Tourism Board has issued guidelines to build trust and certainty among tourists by issuing a 'clean and safe' seal to establishments that conform to the prescribed protocols to ensure safety; maintenance of proper disinfection, sanitation, and hygiene; accurate social distancing measures; and so on. Many governments, including some from the CAREC region, such as Azerbaijan and Georgia, have issued similar guidelines to instill confidence and assure tourists about the cleanliness and safety of popular destinations. The government can greatly assist in winning this war to revive the tourism sector by doing the following:

- Issuing mandatory safety guidelines and protocols to be followed by all public and private sector establishments to ensure safety, hygiene, and security.
- Issuing advisories on how technology can be used to meet the above guidelines.
- Providing special incentives to tourism sector firms that implement the latest technological innovations designed to improve tourist/customer safety, hygiene, and security.
- Providing a massive policy and budgetary boost for improving the mobile and high-speed internet connectivity in all tourist destinations.
- Providing incentives to ICT firms to set up support centers in all tourist destinations.

Specific recommendations to this effect are made later on in this chapter.

213. **What is the regional dimension of any of these measures, versus purely national?**

Many of the common recommendations made in this report have the potential to be implemented at a regional level. For instance, taking advantage of geographic proximity and similar constraints, most of the novel technological developments and ideas—such as facilitating regional air bubbles and cross-border travel, contactless immigration, and developing a robust regional tourism portal—will reap significantly more benefits than each country trying to do this individually. Also, such regional cooperation will significantly reduce the cost of technology implementation. For instance, negotiating collectively with large global technology developers will improve the attractiveness of participating countries (given the larger market size) and help bring down licensing and associated costs. Furthermore, with common regional safety protocols and the need for travel documentation to be provided by visitors, this will enthuse prospective tourists to travel to multiple destinations within the region.

## Recommendations for Government Agencies

214. This section provides overarching recommendations applicable to varying degrees for all countries in the CAREC region. **These, with suitable contextualization for each CAREC country, can act as broad guides for planning and decision-making, to promote the use of technology, for not only increasing visitor safety and security but also to provide them with a better overall experience and a more comfortable stay.** Cluster/country-specific recommendations are in the next section of this report.


**Maximize contactless and digital transactions.** To minimize the chances of any viral transmission, reduce direct human interface and touchpoints, use technology to maximize contactless interactions, and promote a low-touch economy. A tourist ends up interacting with a human either to access a service, to seek information, or to buy goods or services. Various technology solutions—ranging from state-of-the-art AI-enabled face recognition systems to a simple contactless biometric system—can be deployed at all major tourist venues to provide confidence and give safety assurance to visitors so that they are willing to travel. Technology can be used to achieve the seemingly contradictory objectives of minimizing physical human touchpoints but still providing the hospitable and 'tailored' service required by visitors.

**Make information ubiquitous.** Ensure that up-to-date, reliable, and relevant information is made available to visitors at all times, preferably in multilingual and easy-to-access formats. All visitors require specific information about hotels, public transport options, restaurants, and places to visit and to avoid (either owing to high crime rate or health reasons/virus-affected areas) throughout their stay. Similarly, tourism sector stakeholders and service providers also need information, either for themselves or to serve their visitors. This real-time information should be seamlessly accessible through different channels—such as, visitors' laptops or mobiles, public information kiosks and display boards, or emergency information through television and radio broadcasts. The ubiquitous availability of credible and relevant information

generates trust and confidence among visitors and increases their ability to help themselves without relying on any local contact or person. Early trends already show that visitors are more willing to travel to those destinations where they have easy access to information about the local contagion, security and safety measures, and emergency help.

**Rapidly scale up broadband internet connectivity.** Virtually all technologies require internet connectivity. Most—such as cloud computing, IoT, and VR—simply cannot work without a fast and stable internet connection. Therefore, making sure of a fast internet connection, through a combination of optic fiber, mobile 4G/5G, and so on, is the single most important need, and one that only governments can address. Improving internet availability throughout a country will also have many other positive outcomes, such as, a spur in e-commerce transactions—business to business (B2B), business to consumer (B2C), business to government (B2G); improvements in sector wide communications and coordination; and, above all, creating a sense for tourists of always being within reach.

**Adopt a regional approach:** On the demand side, travelers can travel with ease to multiple destinations within the CAREC region if the visa protocols and safety restrictions are the same across these countries. On the supply side, having a regional protocol and specifications will make it easier for technology service providers to develop customized products and solutions that meet these requirements. This will also bring down the cost by encouraging harmonious training systems and sharing of information in the regional market. Many governments have had success with common protocols for mandatory safety standards. Governments must 'set proportionated safety and hygiene protocols to reduce risks throughout the whole tourism value chain and at each step of the traveler's journey.'[27] Regional cooperative activities will significantly increase the operation standards of tourism services through enhanced cooperation.

**Ensure a more immersive experience through technology.** Typically, the richness of the immersive experience during any travel comes from interacting with the local people, listening to local music, buying the local art and crafts. Now, given the restrictions imposed by the pandemic and the consequent imperative need to minimize direct human interactions, this poses a huge challenge in how to provide an enriching experience to visitors. Although no technology interface can act as a substitute for human interface, the use of technology can provide other means to increase the richness of the experience. Technologies such as VR and AR combined with human and AI-powered interfaces can make information available and help to create a safe, delightful, and immersive experience by blurring the lines between reality and the virtual world.

**Deliver personalized, not standardized services.** Word of mouth has always been the most influential factor in the tourist's choice of destination, hotels, restaurants, and buying tourism products and services. The escalation in the use of social media platforms, blogging to publish a personal suggestion as a travel blog, price comparing online sites, tourism offer sites, and so on, plays a major part in influencing where visitors choose to go, stay, eat, and shop. Reviews posted by previous customers and visitors are considered a much more reliable and authentic source of information than traditional institutional and formal communication channels. Now, the traveler is not only a consumer of information but has also become the main provider of tourism

27. UNWTO *Priorities for Tourism Recovery* 28 May 2020.

information. This also proves to be cost-effective in building strong tourism brand marketing opportunities for lesser-known destinations and services. The bidirectional communication ensures that instead of delivering uniform services to all visitors, today's tourism industry can focus on using technologies such as big data to deliver tourism products and services based upon an individual's unique profile, requirements, and preferences.

**Design a comprehensive tourism portal.** As emphasized, the importance of the digitalization of services cannot be undermined. To implement the same, it becomes essential for each stakeholder to develop their website or other digital services. This may lead to extra costs or unequal development across stakeholders; such services could be provided jointly. Thus, governments or tourism bodies should develop a central portal or website where all service providers could provide certain minimal information about their services. Service providers may individually provide additional details about their services, but a common minimal information portal would help in streamlining operations and reducing costs. Stakeholders must provide travelers with clear information about existing measures in place at destinations and companies, as well as clear information on what to expect (rights and guarantees if falling sick while traveling or at the destination).[28]

**Incentivize shrink-wrapped solutions.** In our research, certain services are found that are common across all tourism stakeholders. For instance, check-in and check-out services or payment services are found to be common across stakeholders; these services have certain technologies, both hardware and software, associated with them. Instead of each stakeholder individually adopting these technologies, the government or tourism associations or the respective chambers of commerce could provide a single 'shrink wrap solution' comprising hardware, software solutions, and support services for the individual stakeholder to adopt. The tourism associations or government bodies could invite, at a national or regional level, IT service providers to provide a 'shrink wrap solution' catering to these specific needs for a certain price. Administrations could launch a 'global challenge' for IT service providers to provide one-time solutions. This would help reduce costs and time spent and make technology accessible to the smallest of the service providers, who individually may not have the bandwidth to adopt these changes. This solution could be facilitated at national, regional, or state level.

**Incentivize innovative solutions through existing innovation fund(s).** Like in any other sector**,** bigger players in the tourism sector have better access to capital, human resources, and technology. It is smaller businesses that have limited resources to access innovative technologies. Most CAREC countries already have innovation funds aimed at promoting innovation in the private sector. The government could utilise these existing innovation funds to promote the design and development of affordable, easy-to-implement, low-maintenance technology solutions for the tourism sector. This recommendation will not drive innovation in the sector, but through national tourism boards, chambers of commerce, and trade associations, this technology can feasibly be made available to smaller businesses.

**Provide incentives for technology adoption.** To incentivize and facilitate smooth technological adoption, governments and associations could provide loans at cheaper interest rates, support packages, or design incentives for tourism service

28. https://portugalcleanandsafe.com/en

providers willing to adopt the technology. These could include duty drawbacks or lower import duty rates on imported technology; priority approvals for bank loans; deferred interest payments; and fixed duration moratoria on loan repayments. This would incentivize the rapid adoption of technology.

**Map and control the risk of spread.** Technology can control the crowd, ensure social distancing practice, and avoid the incursion of the virus in a closed area. A live display installed at the entrance of any building can show the number of people entering inside. Real-time visual alerts make it easy to see if the occupancy is about to exceed the set limit so the staff can respond appropriately. The results of all Corona tests when plotted on a digital map to identify pandemic hotspots and mobile alerts will help tourists and residents alike to avoid such areas and will lessen tourist anxiety. Public transit smart cards can help trace visitors who do not have smartphones.

**Promote skill developments.** Adoption of technology is not a one-time event but a gradual process. For the smooth adoption of technology, it is important to train stakeholders on how to adapt and employ technologies. Suitable capacity building and skills development programs need to be designed to bridge the skills gap, especially for the smaller players in the tourism value chain.

**Digitize and establish a national database for arts and crafts.** Technologies such as VR and AR must be promoted to provide a richer experience to visitors while reducing human contact. Creating a spatially referenced national database of arts and crafts, and the digitization of arts, crafts, and artefacts are much-needed initiatives in themselves to preserve the rich heritage and culture of local communities and regions. Combined with technology, these will create income generation opportunities for artists, artisans, craftsperson, and people engaged in creative industries.

**Adopt multi-stakeholder, multidisciplinary approach.** The ongoing COVID pandemic has impacted the entire tourism industry. Tourism necessarily requires many different private and public sector agencies to work in close proximity. If any destination has to implement a holistic and credible plan to address the health and safety concerns of visitors, no single agency can do so in isolation. From the time a visitor lands at the airport to his/her immigration check-in, the journey to the hotel, check-in and stay at the hotel, and travel to different parts of the city, all these actions expose him/her to the risk of contracting the virus. Therefore, unless visitors are assured that each aspect of his/her entire stay would be conducted safely, s/he is reluctant to travel. Therefore, it is imperative to adopt a multi-stakeholder approach, with each stakeholder not only performing their role as per safety protocols but those information-sharing platforms that connect all stakeholders for a cooperative and supportive approach. All private and public sector entities need to come together and be willing to share information. The main idea is to use the relevant technology to develop a unified dialog, approach, and agreement to follow common protocols and guidelines.

**Adopt an incremental approach.** Technologies such as AI, cloud computing, and IoT can play a significant role in streamlining operations, improving productivity, and making continuous improvement for providing a better service to visitors. Some of these technologies work directly in contact with the visitor in making the travel experience safer and more comfortable. Other applications of the same

technologies can work indirectly at the backend of tourism sector service providers and help in creating a conducive eco-system in which the tourist operates. For example, cloud computing when used at the frontend can provide a central repository of common information for visitors, while at the backend this same technology ensures that even smaller service providers can 'rent' world-class software applications—such as, HR, billing, and inventory management—making it easier for them to manage their operations. However, all these technologies cost time, money, and effort and so, except for a handful of global multinationals, can only be feasibly adopted in a phased and incremental manner to not only allow investments to be spread over time, but also to allow tourism sector staff and manager capacity to be built over time.

**Use technology to create and sustain jobs.** According to UNWTO's latest report at least 120 million worldwide are at risk in the tourism sector. Despite the best efforts of governments, thousands—if not hundreds of thousands—of small businesses and firms will close down, resulting in millions of people without a job. Technology, while on one hand will reduce the number of jobs by automating many manual operations and reducing the need for human interfaces; at the same time, it will create many jobs because of the need to design, implement, and support the technology solutions. In the tourism sector, the number of semi-skilled jobs that can be easily replaced by automation will reduce. There will be a massive demand for more skilled 'knowledge workers' who are proficient in the use of technology.

**Launch targeted social media campaigns.** Use social media, such as Facebook, Twitter, and Instagram, to promote safe destinations and build awareness and trust about each country/destination's offering. Social media, unlike traditional media, allows very specific targeting to ensure that only people who match the required profile are sent the posts, thereby reducing costs and maximizing the impact. The government must 'create communication campaigns geared towards confidence-building including the safety measures undertaken by the destinations and companies.'[29]

**Legislate data privacy and protection cyber laws.** One of the negative consequences of the use of technologies—such as, face recognition, contactless digital transactions, and biometric identification—is that the individual's sensitive and personal digital data is widely used and becomes potentially available for malicious use, spamming, or even hacking. It is therefore critical that the government put effective legislation into place which ensures that data can only be captured and used with the person's prior consent and then strong security mechanisms are put in place to avoid the use of data for unintended use without prior user consent. As digital transactions increase, existing laws need to be amended so that digital transactions do not require paper documentation to be enforced in a court of law, in case of disputes. For instance, digitally signed documents should be considered authentic and on a par with paper-signed documents.

**Facilitate air bubbles and cross-border travel.** Country governments and CAREC regional forums must use technology to support travel facilitation towards e-visa/visa on arrival/no visa policies and implement contactless immigration check-in procedures to stimulate demand and make it easier to travel, especially within the CAREC region.

29. UNWTO *Priorities for Tourism Recovery* 28 May 2020.

**Develop a national online register for all international tourists.** Having a digital register of all inbound visitors, along with their local contact details, will greatly assist in tracking and providing relevant information to and collect information from these visitors, especially in case of emergency. This can easily be done by issuing smart card visa cards, issued when a visa is granted/stamped at the time of immigration. The cost of such cards can be recovered from the visitor through a small fee levied along with the visa fee.


**Establish a national ICT taskforce to support the tourism sector.** Establish a high-level taskforce comprising representatives from the ICT ministry, tourism ministry, leading private sector ICT firm working in the tourism sector, and representatives of various industry associations to finalize the list of technology initiatives to be undertaken to support the tourism sector and develop a detailed action plan for implementation of the same.

## Potential Areas for Financial and Technical Support by ADB and Other Multilaterals

CAREC countries could seek investment lending support from ADB and other multilateral agencies to supplement their own national budgets, to finance the following critical areas to promote the adoption of technology in the tourism sector.

- **Finance ICT infrastructure.** All tourist destinations, especially those in cluster C countries, require major investments in ICT infrastructure. This could include mobile and broadband internet connectivity, Wi-Fi in tourist spots, advanced technologies such as AI for crowd control, tourist screening and tracking, and tourism information systems.

- **Support skill development.** Skills upgrades to promote ICT and digital literacy within the tourism sector, where large skill gaps exist, would pave the way for introducing more technology solutions in the sector. Widescale job-specific training paid for by the private sector but made cost-effective through multilateral funding would allow tourism sector stakeholders to visualize and conceive appropriate technology solutions and then to implement them efficiently. Creating skills-based qualifications systems, promoting apprenticeship and on-the-job training programs, and setting up national occupational standards will all help in the growth of the sector.

- **Line of credit for MSMEs.** Lack for finance has been cited as the single biggest roadblock for modernizing the tourism sector and implementing the much-needed technology upgradation. Setting up a skills-based line of credit to provide financing to MSMEs (micro, small, and medium-sized enterprises) in the tourism and hospitality sector for the adoption of technology, would greatly expedite the technology adoption. Development banks and other international financial institutions can make available this credit line in cooperation/partnership with existing local national banks to provide collateral requirement-free loans at capped interest rates.

- **Set up tourism development zones.** Multilateral funding to provide technical and financial assistance for the establishment of dedicated tourism zones would bring in much-needed private sector investments and help rejuvenate the local economy in tourism destinations. Set up along the lines of technology parks and export processing zones (EPZs), tourism zones would entail local governments earmarking a large parcel of land, providing basic urban

services—such as 24-hour electricity, water, sanitation, mobile and broadband connectivity—and providing incentives—such as tax holidays and single window clearance—to attract private sector investments in hotels, restaurants, theme parks, spas, and other tourist facilities. Private investment proposals would be selected based upon their ability to bring in cutting-edge technology to improve customer services, creating and enriching existing tourist attractions, and creating local jobs.

- **Institutional development.** Lack of adequate destination management and institutional capacity has been threatening assets and local communities, and reduced visitor satisfaction and retention. Weak planning and management of destinations has led to their unregulated growth, resulting in the exclusion of the poor from local economic development. Limited institutional capacities, unclear roles and responsibilities among government agencies, and uncoordinated development efforts in city development, tourism promotion, and local economic development have led to inadequate protection, management, and promotion of assets, and inadequate development of tourist products. Significant investments and a sustained program of capacity building and tourism sector reforms, accompanied by a systematic institutional development, will pave the way for meeting the enormous growth potential of tourism in CAREC region.

## How Technology Can Support CAREC Tourism Strategy Actions

215. *CAREC Tourism Strategy 2030* proposes a series of actions aimed at achieving the vision as stated in chapter 2. The following section provides a summary of these actions and shows how the proposed innovative technology recommendations can be used to support the strategic pillars of *CAREC Tourism Strategy 2030*. Detailed recommendations for each strategy pillar can be found in Annexure B.

**Table 7: Proposed recommendations and their relevance to CAREC Tourism Strategy Pillars 2030**

| Government Recommendations | Pillar 1 Connectivity & Infrastructure | Pillar 2 Quality and Standards | Pillar 3 Skills Development | Pillar 4 Marketing and Branding | Pillar 5 Market Intelligence |
|---|---|---|---|---|---|
| Maximize contact-less and digital transactions | | ✓ | | | |
| Make information ubiquitous | | ✓ | ✓ | ✓ | ✓ |
| Rapidly scale up broadband Internet connectivity | | | ✓ | ✓ | ✓ |
| Adopt a Regional Support | ✓ | ✓ | | ✓ | |
| Ensure more immersive experience through technology | | | | ✓ | ✓ |
| Deliver personalized, not standardized services | | ✓ | | ✓ | ✓ |
| Design a comprehensive Tourism portal | | | ✓ | ✓ | |
| Incentivize Shrink-wrapped solutions | | ✓ | | | |
| Incentivize innovative solutions through Innovation Fund | | | ✓ | ✓ | |
| Provide incentives for technology adoption | | | ✓ | | |
| Map and Control Risk of Spread | | ✓ | | ✓ | |
| Promote Skill Developments | | | ✓ | | |
| Digitize and establish a national database for arts and craft | | ✓ | | ✓ | |
| Adopt multi-stakeholder multi-disciplinary | | ✓ | ✓ | | |
| Adopt an incremental approach | | ✓ | | | |
| Use technology to create and sustain jobs | | | ✓ | | |
| Launch targeted social media campaigns | | | | ✓ | ✓ |
| Legislate data privacy and protection cyber laws | | ✓ | | | ✓ |
| Facilitate air bubbles and cross border travel | ✓ | | | | |
| Develop a national online register for all International | | | | ✓ | ✓ |
| Establish a national ICT Task Force to support tourism industry | | ✓ | ✓ | | |

# Cluster A Recommendation

**China, Azerbaijan, Georgia, and Kazakhstan**

## Cluster A: Recommendations: China, Azerbaijan, Georgia, Kazakhstan

The following section provides cluster-specific recommendations that are categorized based on their ease of adaptability as short, medium, and long term. These recommendations are addressed to public sector authorities for smoother technological adoptions in the tourism industry.

### Short term

1) Frame regulations for compulsory implementation of a minimum set of standards/guidelines/protocols for each tourism sector segment (such as, hotels, restaurants, and public transport) to improve visitor hygiene and safety, based on the suggested guidelines described in chapter 4 of this report. This initiative may be branded on the lines of the 'safe to travel' campaign launched in other leading countries.
2) Issue guidelines for implementing relevant technology options to meet these regulations, based upon the broad guidance provided in chapter 4.
3) Issue 'safe to travel' seal to all entities, which comply with minimum safety standards/guidelines.
4) Create a destination-specific comprehensive portal for providing information to tourists.
5) Implement a comprehensive, accessible online database for providing tourism statistics and trends.
6) Launch targeted social media campaigns to promote destinations and themed circuits (such as, eco-tourism, wellness, and adventure).
7) Promote destinations through overseas travel agents, tour operators, online aggregators, and travel portals.
8) Implement a 'manned' helpdesk and management information system (MIS) for providing tourism-related information and health emergencies.
9) Implement common quality and safety standards, which are made mandatory for service providers to adhere to.
10) Launch short-term IT skills-building training for industry members in remote areas to decrease the digital illiteracy level.
11) Launch a pilot smart entity project for different sectors of the tourism industry as a showcase.

### Medium term

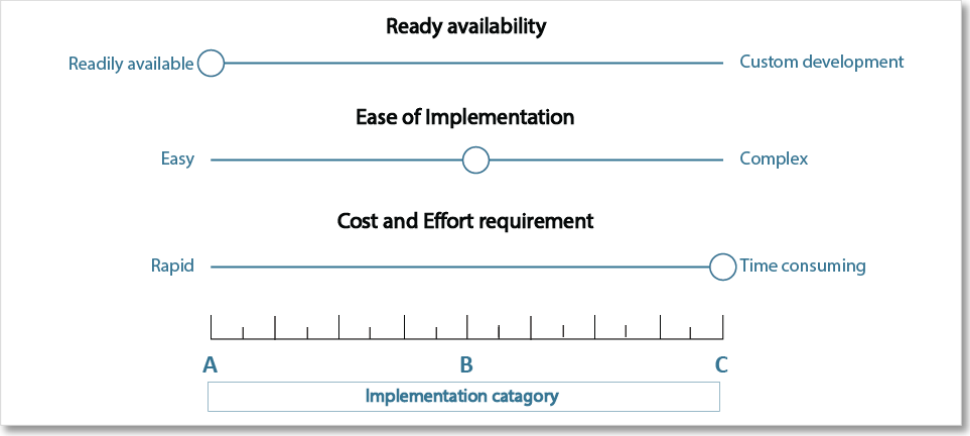
1) Develop a common platform for ICT vendors and solution providers to come together and offer 'shrink-wrapped' solutions for each segment of the tourism sector.
2) Provide financial incentives such as loans at reduced rates, interest payment moratoria, and tax waivers for implementing cutting-edge technologies.
3) Establish innovation funds and loans for tourism sector MSMEs.
4) Develop a national web portal for visitors showing tangible and intangible cultural assets and products.
5) Implement automated and contactless immigration procedures at all international airports.
6) Launch a special countrywide program for the elimination of digital illiteracy and easy adoption of technology involving different stakeholders.
7) Improve the quality of tourism education and training through the adaptation of ICT tools.
8) Invest in the integration of public and private databases and the e-registration system in the tourism industry.

9) Improve data protection legislation and take necessary technical measures in this direction.
10) Invest in developing affordable software packages for the operation of tourism enterprises.

**Long term**

1) Improve penetration and quality of ICT infrastructure such as broadband internet.
2) Incentives to ICT firms that set up support helpdesks in smaller tourism-focused cities and towns.
3) Implement more stringent compulsory guidelines for DMOs.
4) Use regular visitor satisfaction surveys to gather feedback.
5) Provide free Wi-Fi connectivity at all major tourist sites and public spaces.
6) Launch a special grant program to reduce digital inequality among tourism industry members (cities vs rural areas, chains vs independents).

216. The following section provides technology options that private service stakeholders may consider for implementation to improve the safety and quality of services in their respective establishments. It is based on the following three factors:




These three factors—ready availability, ease of implementation, and cost and effort requirement—vary for different technologies. Some technologies may be relatively inexpensive, simple to implement, and available as an off-the-shelf solution that can be implemented quickly. Others may require significant investment and a sophisticated ICT service provider to implement and support. To give an idea, this three-pronged categorization has been adopted whereby category **A** technology options are those that are readily available, easy to implement, and relatively inexpensive. Category **C** technology options are those that require extensive customization, and a complex and time-consuming implementation process. Category **B** technology options represent the midpoint between the two extremes.

**The points in blue in the section below are specially tailored to address the application of technology in promoting safe tourism destinations.**

217. **Accommodation Service Providers**

**A**

- A combination of the biometric face scan with AI-enabled facial recognition for a safe and contactless check-in and check-out, and ensuring other precautionary measures are in place.
- Digital learning platforms for staff training, skill development, and providing COVID-19 related information and training measures.
- Contactless digital and online payments to replace cash payments.
- QR codes to access reservations or bookings, enter rooms, select and order food items, and so on.
- BYO device-based QR-coded restaurant menus to replace paper menus to avoid touching of common surfaces.
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.

**B**

- AI-enabled smart speaker-based concierge to provide intelligent responses and information.
- AI-enabled predictive analysis for forecasting bookings demand, inventory requirements, and so on.
- AI-enabled automation of routine operations such as revenue management and accountancy.
- Guest's device-controlled appliances (TV, lighting, air conditioning, on-tap entertainment, and so on) in a room linked to IoT sensors.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.

**C**

- Use robots for disinfection and cleaning of common public areas in establishments.
- Crowd control through mobile apps to ensure social distance norms in all public areas using cloud computing and geofencing technology.
- XR in combination with AI to enable tourists to make reservations and bookings.
- Crowd control technology for ensuring capacity optimization and preparing for peak hours.

218. **Food and Beverage Establishments**

**A**

- A combination of the biometric face scan with AI-enabled facial recognition for contactless check-in and checkout and ensuring other precautionary measures are in place.
- Contactless digital payment to replace cash payments.
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- QR codes to access reservations, bookings, and digital menus for replacing paper menus to avoid touching of common surfaces.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Cloud computing in scaling operations as and when required by enabling pay by model thus avoiding extra added costs.

**B**

- Digital learning platforms for staff training and skill development purposes and easy adoption of technology.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.

**C**

- Crowd control technology to ensure social distancing is being practised and seating arrangements are evenly distanced in small enclosed establishments.
- Robots to automate routine tasks to limit human intervention.
- Robots for disinfection and cleaning of common public areas in establishments.
- Crowd control technology for ensuring capacity optimization and preparing for peak hours.

219. **Travel and Tour Operators**

**A**
- Contactless digital payment to replace cash payments.
- Digital learning to train staff and employees for easy adoption of technology.
- QR codes for digital marketing and sharing information.

**B**
- AI-enabled chatbots for responding to visitor queries and enquiries to reduce human interaction.
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- AI-enabled predictive analysis for forecasting bookings demand, inventory requirements, and so on.

**C**
- Crowd control technology to ensure social distancing is being practiced and monitoring crowd movement in open areas and tourism destinations.
- Robots to automate routine tasks to limit human intervention.
- Geofence technology to provide real-time solutions and engage and coordinate tourists at a destination.

220. **Tour Guides**

**A**
- Contactless digital payment to replace cash payments.
- Handheld thermal scanners for a temperature check.
- QR codes to access reservations and bookings.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**B**
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- Digital learning to provide COVID-19 related information and training measures.

**C**
- Geofence technology to provide real-time solutions, engage and coordinate tourists at a destination.
- Crowd control technology to ensure social distancing is being practised and monitoring crowd movement in open areas and tourism destinations.
- VR to enable tourists to have a real-time immersive experience at the tourism destination.

221. **Aviation Industry**

**A**
- Contactless digital payment to replace cash payments.
- Digital learning platforms for staff training, skill development, and providing COVID pandemic-related information and training measures.
- QR codes to access reservations and bookings.
- AI-enabled chatbots for responding to visitor queries and enquiries to reduce human interaction.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.

**B**
- Digital learning platforms for staff training and skill development purposes.
- Use of biometrics and QR codes to enable e-visas for a contactless immigration journey.
- Baggage tracking using RFID and GPS.

**C**

- Crowd control technology to ensure social distancing is being practiced and seating arrangements are evenly distanced in aircraft and at airports.
- Robots to transfer or carry luggage, hence ensuring a contactless experience.
- Robots for disinfection and cleaning of common public areas in establishments.
- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed.

222. **Transport Service Providers**

**A**

- Handheld thermal scanners for a temperature check.
- Digital learning to train staff and employees for easy adoption of technology.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.
- QR codes for digital marketing and sharing information.

**B**

- Baggage tracking using RFID and GPS.
- Digital learning platforms for staff training and skill development purposes.
- Robots to transfer or carry luggage, hence ensuring a contactless experience.

**C**

- Crowd control technology for ensuring capacity optimization and preparing for peak hours.
- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed.
- Crowd control technology to monitor and manage tourists/crowd traffic and movement.
- Use computing to provide real-time information such as time and location and tracking via GPS.

# Cluster B Recommendation

## Kyrgyz Republic, Mongolia, and Uzbekistan

## Cluster B: Recommendations: Kyrgyzstan, Mongolia, Uzbekistan

223. The following section provides cluster-specific recommendations that are categorized based on their ease of adaptability as short, medium, and long term. These recommendations are addressed to public sector authorities for smoother technological adoptions in the tourism industry.

### Short term

1) Identify 'shrink-wrapped' packages of cutting-edge technologies for each segment of the tourism sector, based upon locally available options.
2) Subsidize these packages and make it mandatory for all tourism segments to implement them within a stipulated timeframe, albeit in a phased manner.
3) Create a destination-specific, comprehensive portal for tourist information.
4) Implement a 'manned' helpdesk and MIS for tourism-related information and health emergencies.
5) Develop a national web portal for visitors, showing tangible and intangible cultural assets and products all across the country.
6) Implement e-visa procedures for a contactless entry into the country.

### Medium term

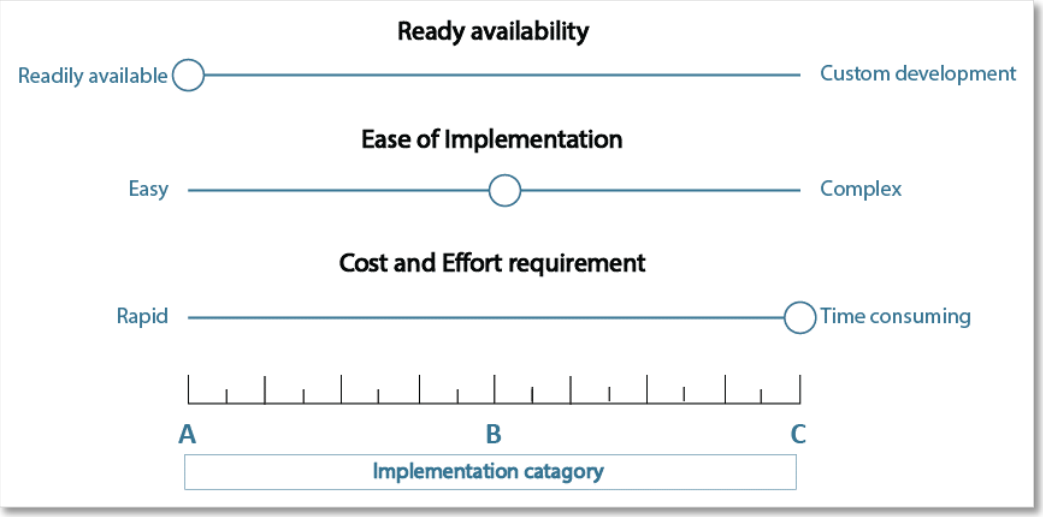
1) Frame regulations for compulsory implementation of a minimum set of standards/guidelines/protocols for each tourism sector segment (such as, hotels, restaurants, public transport, and so on) to improve visitor hygiene and safety based upon the suggested guidelines described in chapter 4 of this report. This initiative may be branded on the lines of the 'safe to travel' campaign launched in other leading countries.
2) Develop toolkits for implementing relevant technology options to meet the above-mentioned standards/guidelines/protocols, based upon the broad guidance provided in chapter 4.
3) Offer financial incentives such as loans at reduced rates, interest payment moratoria, and tax waivers for implementing innovative technologies.
4) Implement a comprehensive, easy-to-access online database for providing tourism statistics and trends.
5) Launch targeted social media campaigns to promote destinations and themes circuits (themes such as eco-tourism, wellness, adventure, and religious tourism).
6) Promote destinations through overseas travel agents, online aggregators, and travel portals.
7) Develop a central electronic payments system so that visitors can use this to pay for tourism products and services even from MSME.
8) Design and deliver ICT skill development programs for all tourism stakeholders for easy adoption of technology.
9) Launch pilot smart entity projects for different sectors of the tourism industry as a showcase.

### Long term

1) Improve penetration and quality of ICT infrastructure, especially broadband internet, all across the country and specifically in all areas of tourist interest as a priority.

2) Incentives to ICT firms that set up support helpdesks in smaller tourism-focused cities and towns.
3) Implement compulsory guidelines through technology-enabled solutions, especially for and through DMOs.
4) Develop ICT human resources in the country that include ICT education and technical skills to improve the talent pool for the tourism and hospitality sectors.
5) Use regular visitor satisfaction surveys to gather feedback about problems faced by visitors and how these problems can be alleviated.
6) Launch a special countrywide program for the elimination of digital illiteracy and easy adoption of technology involving different stakeholders.
7) Improve the quality of tourism education and training through the adoption of ICT tools.
8) Invest in the integration of public and private databases and e-registration system in the tourism sector.
9) Improve data protection legislation and take necessary technical measures in this direction.
10) Invest in developing affordable software packages for the operation of tourism enterprises.

224. The following section provides technology options that private service stakeholders may consider for implementation to improve the safety and quality of services in their respective establishments. It is based on the following three factors:




These three factors—ready availability, ease of implementation, and cost and effort requirement—vary for different technologies. Some technologies may be relatively inexpensive, simple to implement, and available as an off-the-shelf solution that can be implemented quickly. Others may require significant investment and a sophisticated ICT service provider to implement and support. To give an idea, this three-pronged categorization has been adopted, whereby category **A** technology options are those that are readily available, easy to implement, and relatively inexpensive. Category **C** technology options are those that require extensive customization, and a complex and time-consuming implementation process. Category **B** technology options represent the midpoint between the two extremes. The blue shaded suggestions in the following segment exclusively represent and particularly address the application of technology in promoting safe tourism destinations.

225. **Accommodation Sector**

**A**
- QR codes to access reservations and bookings or enter rooms.
- Contactless digital payment to replace cash payments.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**B**
- Digital learning to train staff and employees for easy adoption of technology
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Big data and data analytics for reputation management.
- Big data and data analytics for aggressive and customized marketing techniques.
- AI-enabled smart speaker-based concierge to provide intelligent responses and information.

**C**
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- A combination of biometrics face scan and AI-enabled facial recognition for controlling and monitoring access to common areas and services.
- IoT for a centralized control and information system for tourists to control room temperature, smart locks, and other amenities.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.

226. **Food and Beverage Establishments**

**A**
- Contactless digital payment to replace cash payments.
- QR codes to access reservations, bookings, and payments.
- QR codes for digital menus replacing paper menus.

**B**
- AI-enabled chatbots for responding to visitor queries and enquiries to reduce human interaction.
- Digital learning to train staff and employees for easy adoption of technology.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Cloud computing in customer for long-term customer relationship management by integrating customer details and social media accounts, giving service providers access to tourist's information.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and customer management.

**C**
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- A combination of biometrics face scan and AI-enabled facial recognition for controlling and monitoring access to common areas and services.
- Robots to automate routine tasks to limit human intervention.
- Robots for disinfection and cleaning of common public areas in establishments.
- Crowd control technology to ensure social distancing is being practised and seating arrangements are evenly distanced in small enclosed food and beverage establishments.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.
- XR to replace pamphlets and paper menus with digital 3D information providers.

227. **Travel and Tour Operators**

**A**
- QR codes for digital marketing and sharing information.
- Contactless digital payment to replace cash payments.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Cloud computing in customer for long-term customer relationship management by integrating customer details and social media accounts, giving service providers access to visitor's information.

**B**
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Digital learning to train staff and employees for easy adoption of technology.
- AI-enabled predictive analysis for forecasting bookings demand, inventory requirements, and so on.
- Cloud computing in scaling operations as and when required by enabling pay by model, thus avoiding extra added costs.

**C**
- Crowd control technology for ensuring capacity optimization and preparing for peak seasons.

228. **Tour Guides**

**A**
- Handheld thermal scanners for a temperature check.
- QR codes to access reservations, bookings, or enter rooms.
- QR codes for digital marketing and sharing information.
- Contactless digital payment to replace cash payments.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**B**
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**C**
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- Crowd control technology to ensure social distancing is being practised and monitoring crowd movement in open areas and tourism destinations.
- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed.
- VR technology for VR-based tourism walks, 3D game-based virtual historic tours, and so on.
- VR to enable visitors to have a real-time immersive experience at the tourism destination.

229. **Aviation Industry**

**A**
- Contactless digital payment to replace cash payments.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**B**
- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- A combination of biometric face scan and AI-enabled facial recognition for checking COVID pandemic precautionary measures are in place.

- A combination of the biometric face scan with AI-enabled facial recognition using contactless check-in and check-out.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.
- Baggage tracking using RFID and GPS.
- Use of cloud computing to provide real-time information such as time and location, and tracking via GPS.

**C**

- Robots to transfer or carry luggage, hence ensuring a contactless experience.
- Crowd control technology to ensure social distancing is being practiced and seating arrangements are evenly distanced in small, enclosed establishments.
- Crowd control technology for ensuring capacity optimization and preparing for peak hours at the airport.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.
- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed.

230. **Transport Service Providers**

**A**

- QR codes to access reservations, bookings, or enter vehicles.
- Contactless digital payment to replace cash payments.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**B**

- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed
- AI-enabled predictive analysis for forecasting bookings demand, inventory requirements, and so on.
- Use of cloud computing to provide real-time information such as time and location, and tracking via GPS.

**C**

- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- Use of cloud computing to provide real-time information such as time and location, and tracking via GPS.

# Cluster C Recommendation

## Pakistan, Tajikistan, Turkmenistan, and Afghanistan

## Cluster C: Recommendations: Pakistan, Tajikistan, Turkmenistan, Afghanistan

The following section provides cluster-specific recommendations that are categorized based on their ease of adaptability as short, medium, and long term. These recommendations are addressed to public sector authorities for smoother technological adoptions in the tourism industry.

**Short term**

1) Identify relevant low technological and inexpensive options for each segment of the tourism sector, based on what is locally available.
2) Procure a simple 'shrink-wrapped solution' and make it available to all tourism sector MSMEs at a subsidized cost.
3) Set up a national helpdesk for ICT advice and support for tourism MSMEs.
4) Implement a 'manned' helpdesk and MIS for tourism-related information and health emergencies.
5) Develop a national web portal for visitors showing tangible and intangible cultural assets and products.
6) Make available cheap mobile SIMs and Wi-Fi connectivity at all major tourist sites and public spaces.

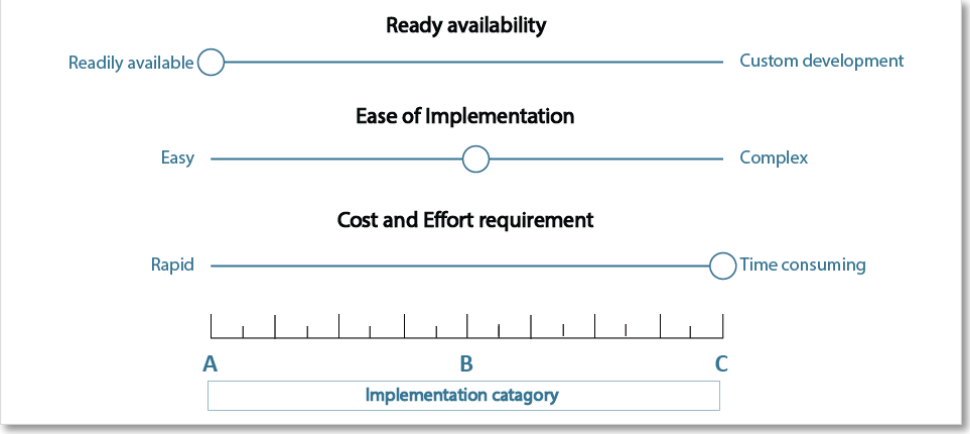
**Medium term**

1) Provide incentives to ICT firms that offer 'shrink-wrapped' package based on cloud-based technologies for each segment of the tourism sector, which can be adopted by MSMEs across the country.
2) Create a destination-specific comprehensive portal for providing information to tourists.
3) Issue guidelines for implementing relevant technology options to meet these regulations, based upon the broad guidance provided in chapter 4.
4) Assign a 'safe to travel' seal to all entities that comply with minimum safety standards.
5) Develop a central electronic payments system so that visitors can use this to pay for tourism products and services, even from MSMEs.
6) Develop a downloadable electronic guide for priority destinations.
7) Implement e-visa procedures for ensuring contactless journeys.

**Long term**

1) Improve penetration and quality of ICT infrastructure such as broadband internet in selected priority locations of tourist interest.
2) Incentives to ICT firms that set up support helpdesks in smaller tourism-focused cities and towns.
3) Implement compulsory guidelines for DMOs and all tourism segments.
4) Develop an internet infrastructure and access across the country.
5) Develop ICT skills and human resources in the country that include ICT education and technical skills to improve the talent pool for the tourism and hospitality sectors.
6) Implement a comprehensive online system for providing tourism statistics.
7) Offer financial incentives such as loans at reduced rates, interest payment moratoria, and tax waivers for implementing technologies.
8) Launch a special country wise program for the elimination of digital illiteracy and easy adoption of technology involving different stakeholders.

231. The following section provides technology options that private service stakeholders may consider for implementation to improve the safety and quality of services in their respective establishments. It is based on the following three factors:




These three factors—ready availability, ease of implementation, and cost and effort requirement—vary for different technologies. Some technologies may be relatively inexpensive, simple to implement, and available as an off-the-shelf solution that can be implemented quickly. Others may require significant investment and require a sophisticated ICT service provider to implement and support. To give an idea, this three-pronged categorization has been adopted, whereby category **A** technology options are those that are readily available, easy to implement, and relatively inexpensive. Category **C** technology options are those that require extensive customization, and a complex and time-consuming implementation process. Category **B** technology options represent the midpoint between the two extremes. The blue shaded suggestions in the following segment exclusively represent and particularly address the application of technology in promoting safe tourism destinations.

232. **Accommodation Sector**

**A**

- QR codes to access reservations, bookings, or enter rooms.
- QR codes for digital marketing and sharing information.
- Contactless digital payment to replace cash payments.

**B**

- AI-enabled chatbots for responding to customer/tourist queries and enquiries to reduce human interaction.
- AI-enabled smart speaker-based concierge to provide intelligent responses and information.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.

**C**

- Digital learning to train staff and employees for easy adoption of technology.
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure and achieving energy efficiency.

233. **Food and Beverage Establishments**

**A**
- Contactless digital payment to replace cash payments.
- QR codes to access reservations, bookings, and payments.
- QR codes for digital menus replacing paper menus.

**B**
- AI-enabled chatbots for responding to customer/tourist queries.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and customer management.

**C**
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.

234. **Travel and Tour Operators**

**A**
- QR codes to access reservations, bookings, or enter rooms.
- QR codes for digital marketing and sharing information.
- Contactless digital payment to replace cash payments.

**B**
- AI-enabled chatbots for responding to customer/tourists queries and enquiries to reduce human interaction.
- AI-enabled predictive analysis for forecasting bookings demand, inventory requirements, and so on.
- Cloud computing in scaling operations as and when required by enabling pay by model, thus avoiding extra added costs.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.

**C**
- Digital learning to train staff and employees for easy adoption of technology and provide COVID-19 related information and training measures.

235. **Tour Guides**

**A**
- Handheld thermal scanners for a temperature check.
- Contactless digital payment to replace cash payments.

**B**
- QR codes for digital marketing and sharing information.

**C**
- Digital learning to train staff and employees for easy adoption of technology.
- Cloud computing for making online reservations and booking, as well as for back-office operations such as accounting and revenue management.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.
- Big data and data analytics for reputation management.

236. **Aviation Industry**

**A**
- QR codes for digital marketing and sharing information.
- Handheld thermal scanners for a temperature check.

**B**
- Biometric face scan and AI-enabled facial recognition for checking COVID-19 precautionary measures are in place.
- Baggage tracking using RFID and GPS.

- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.

**C**

- Digital learning to provide COVID-19 related information and training measures.
- Digital learning to train staff and employees for easy adoption of technology.
- IoT for a centralized control and information system for tourists to control room temperature, smart locks, and other amenities.
- IoT for real-time information sharing, communicating, controlling, and monitoring backend operations, operating smart infrastructure, and achieving energy efficiency.

237. **Transport Service Providers**

**A**

- Contactless digital payment to replace cash payments.
- QR codes to access reservations, bookings, make payments, or enter vehicles.

**B**

- AI-enabled chatbots for responding to visitor queries and enquiries to reduce human interaction.
- Use of cloud computing to provide real-time information such as time and location, and tracking via GPS.
- Big data and data analytics for analytical real-time pricing, discounts, or offers, directly parallel to real-time demand and browsing patterns.

**C**

- Thermal camera scanners enabled with facial recognition for mass scanning of temperatures and notifying in case high temperatures observed.

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74) Digital 2020 Pakistan—*https://datareportal.com/reports/digital-2020-Pakistan*
*75)* Digital 2020 Turkmenistan—*https://datareportal.com/reports/digital-2020-turkmenistan*
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105) Travel Agent Association of Pakistan—*https://www.taap.org.pk/*
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131) Detour: Location-Aware Audio Walks—https://www.youtube.com/watch?v=KHFZ9UUYed0
132) Smart Occupancy—https://www.youtube.com/watch?v=jP6_a6qjtWQ
133) UNWTO Healing Solutions for Tourism Challenge: Outpost Healthy Destinations—https://www.youtube.com/watch?v=R__xN61Y05c
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135) Healing Solutions for Tourism Challenge: iBonus COVID19 Digital Prevention System (Hong Kong, China)—https://www.youtube.com/watch?v=Vt_WWPSjfvs
136) Healing Solutions for Tourism Challenge: iBonus COVID19 Digital Prevention System (Hong Kong, China)—https://www.youtube.com/watch?v=CprRAvJMj3M
137) Healing Solutions for Tourism Challenge: iBonus COVID19 Digital Prevention System (Hong Kong, China)—https://www.youtube.com/watch?v=eCO7RCEFruI
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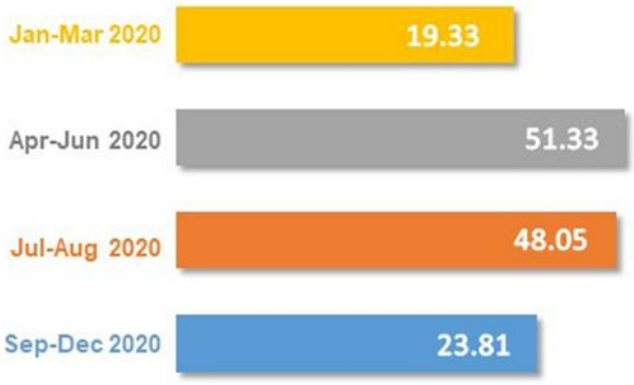
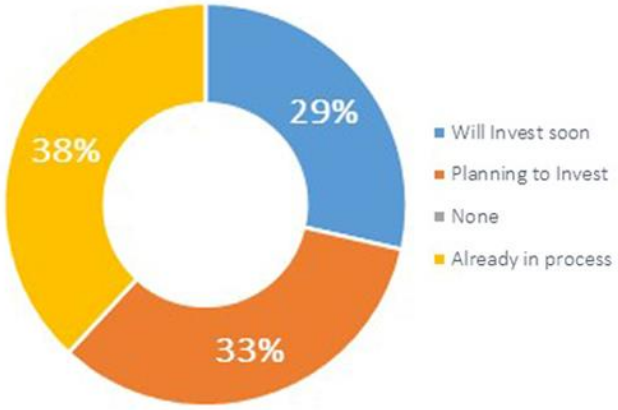
## Annexure A : Survey Results

### Accommodation Type

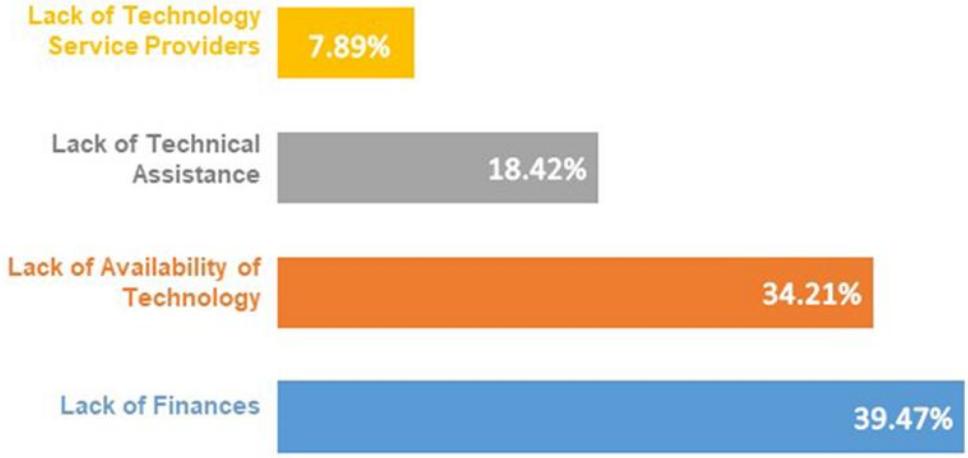
**Estimated percentage decline in business due to Covid-19**



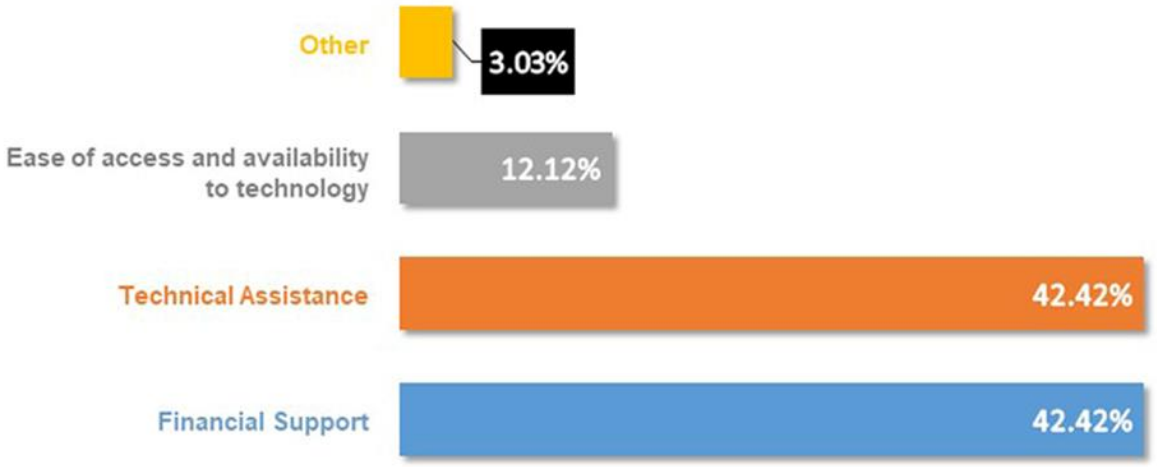

**Considering investing in technology**




**Impediments faced to adopt technology**

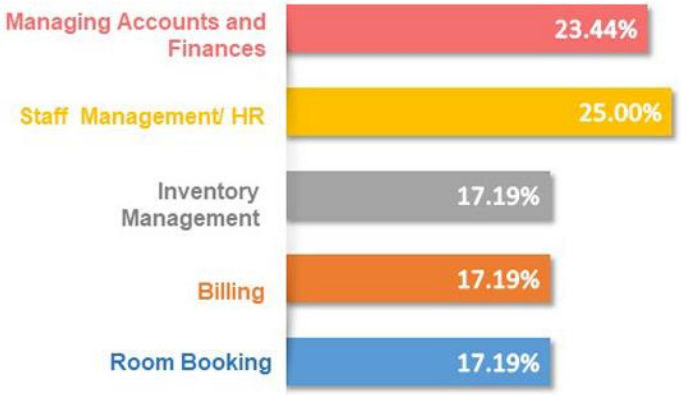



**Support needed from the government in order to adopt technology**

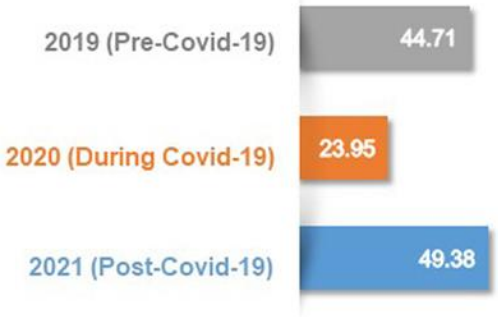


## Accommodation Type

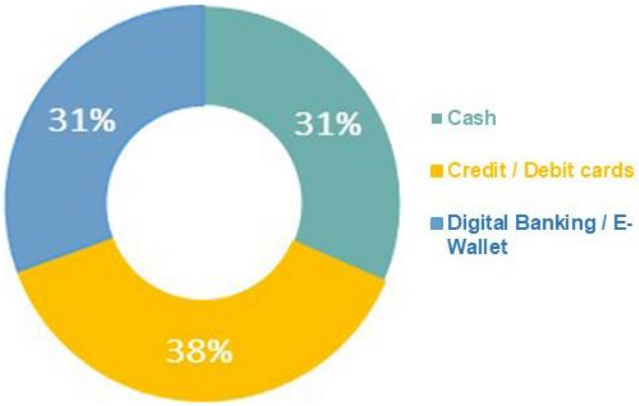
### Use of Computers / Smart Gadgets (Tablets/smartphones)



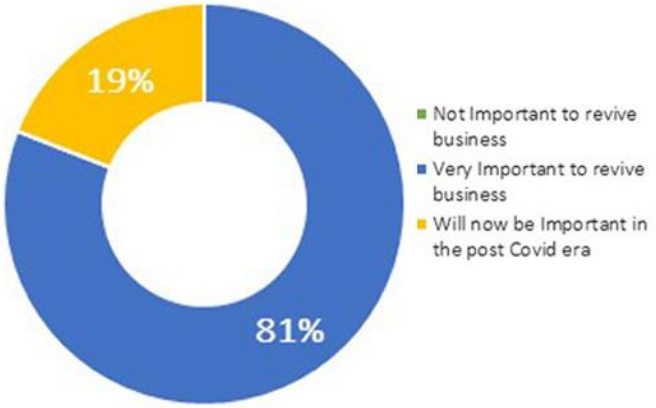

### Estimated percentage decline in your business due to Covid-19



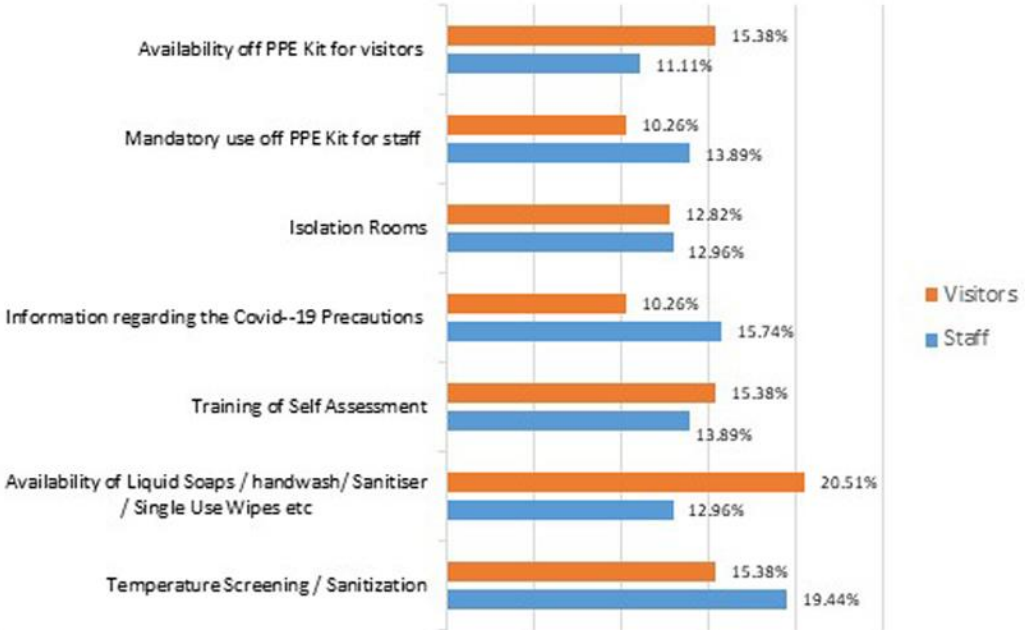

### Mode of payment by guests




### Technology to revive accommodation service providers business in the Post-Covid Era

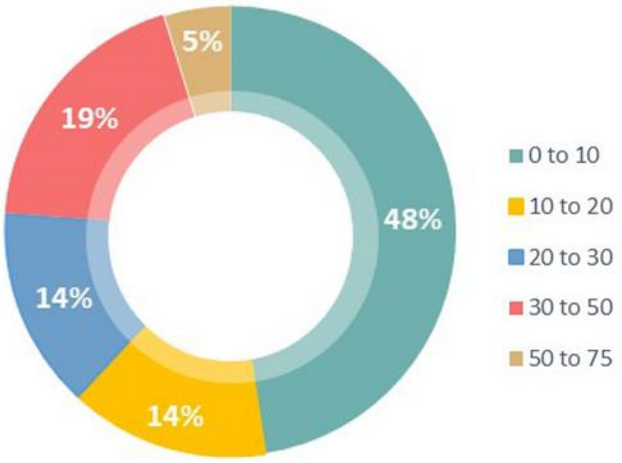



### Measures undertaken to minimize the risk and counter the Covid-19 pandemic (Visitors / Staff)

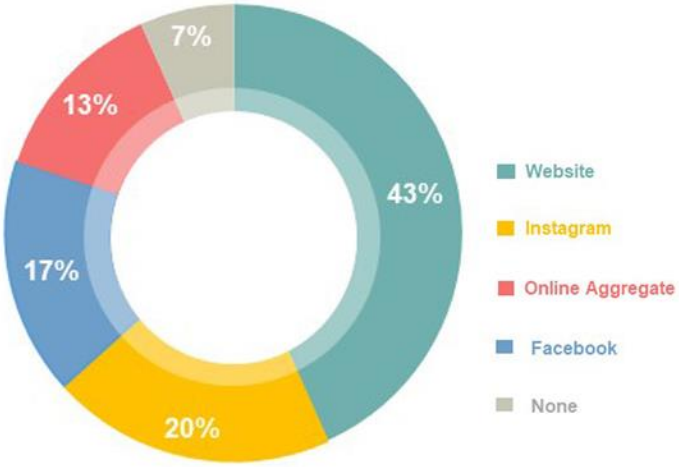


## Food and Beverage

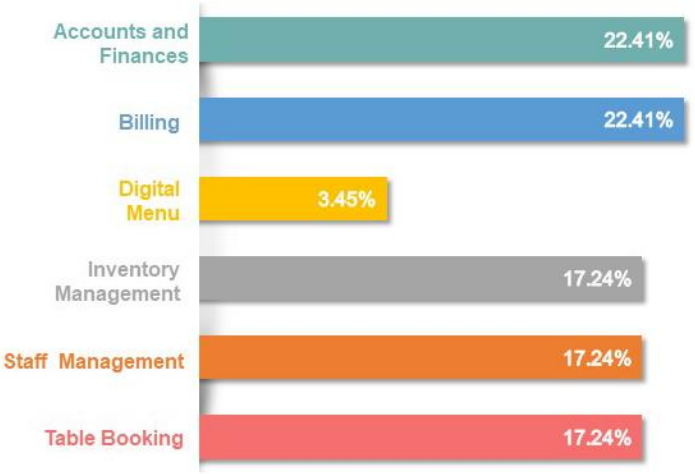
### Seating capacity




### Online presence

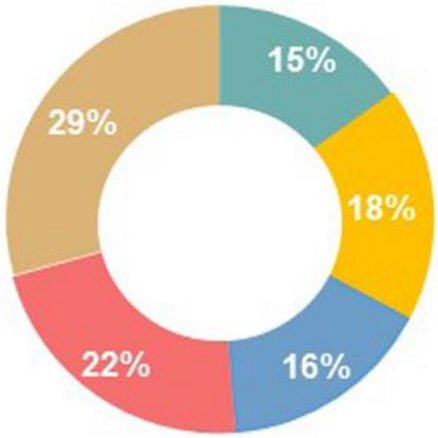



### Use of Computers / Smart Gadgets (Tablets / smartphones)

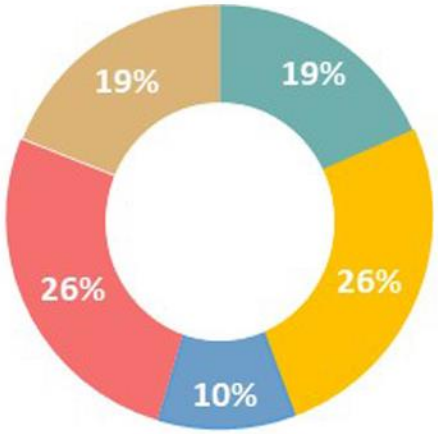



### Mode of booking

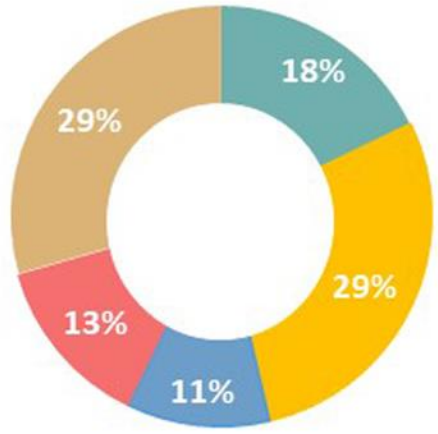
#### 2019 (pre Covid-19)




#### 2020 (During Covid-19)

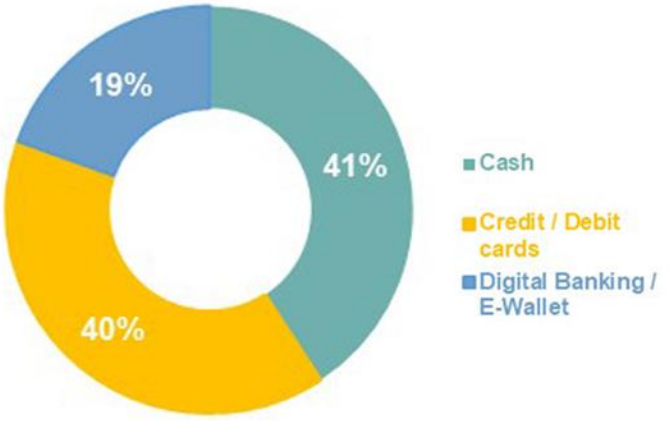



#### 2021 (Post Covid-19)

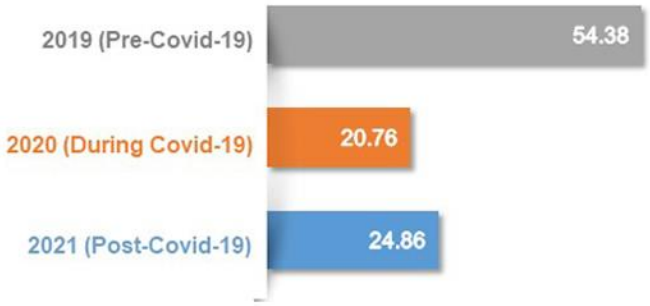



## Food and Beverage

### Typical mode of payment by guests

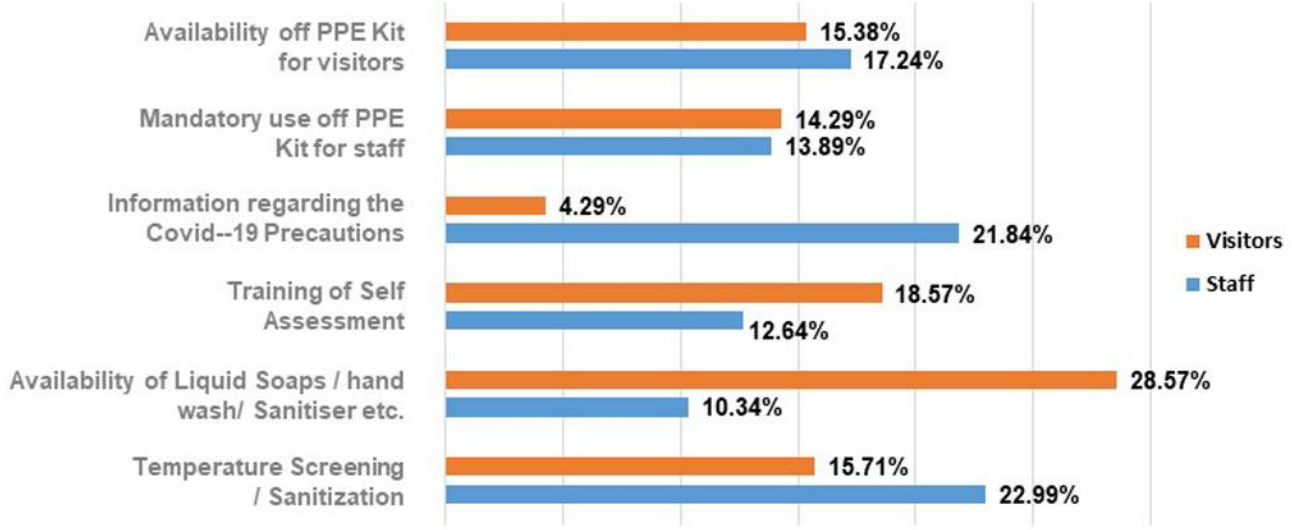



### Present/expected occupancy rate in the respective periods



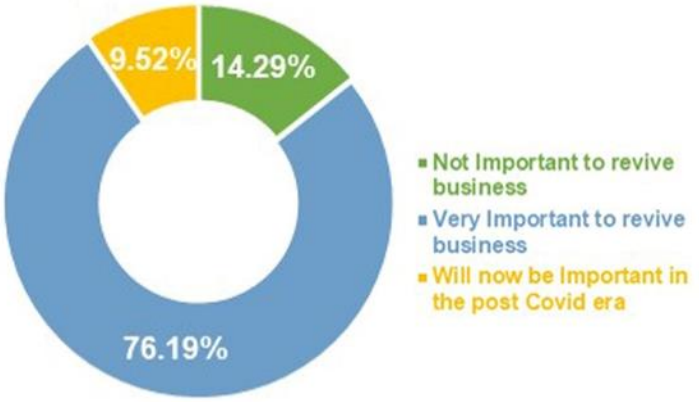

### Estimated percentage decline in business due to Covid-19


### Measures undertaken to minimize the risk and counter the Covid-19 pandemic (Visitors / Staff)

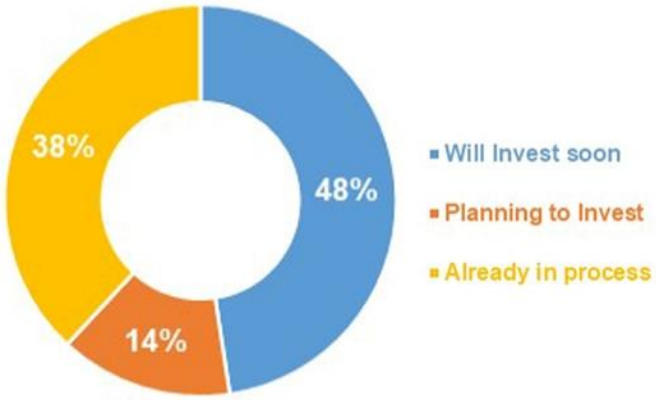


## Food and Beverage

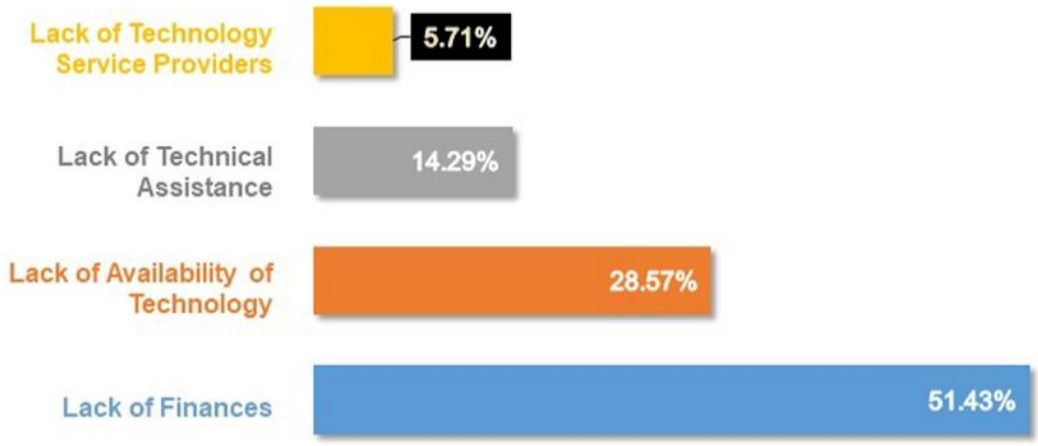
### Technology as an important factor to revive business in the post Covid Era



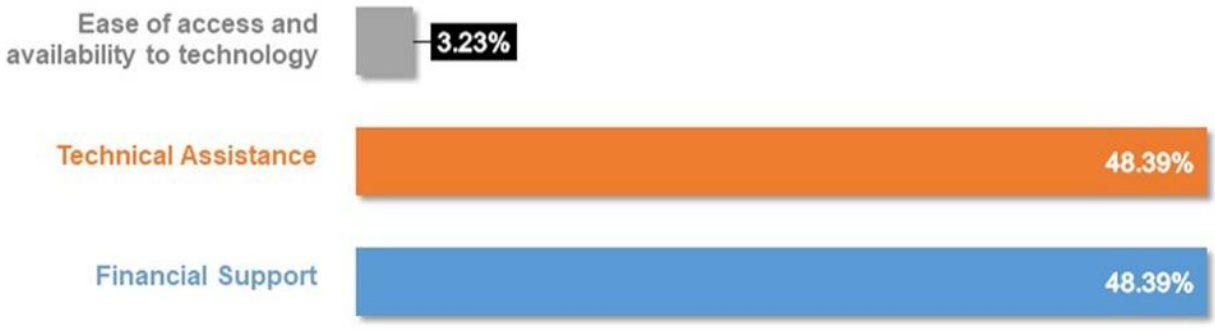

### Considering investing in Technology




### Impediments faced by businesses to adopt technology

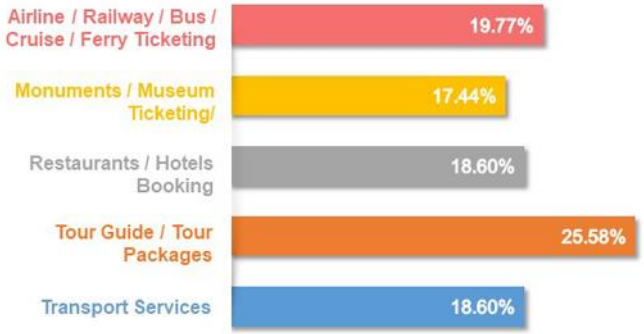



### Support needed from the government in order to adopt technology

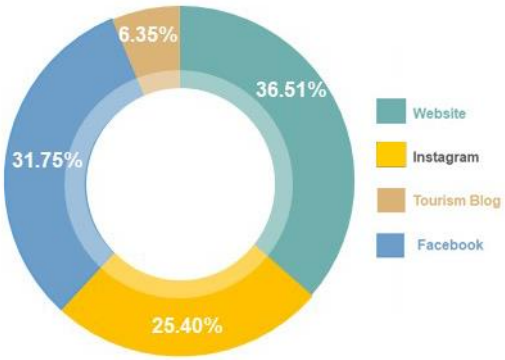


## Tour Agents

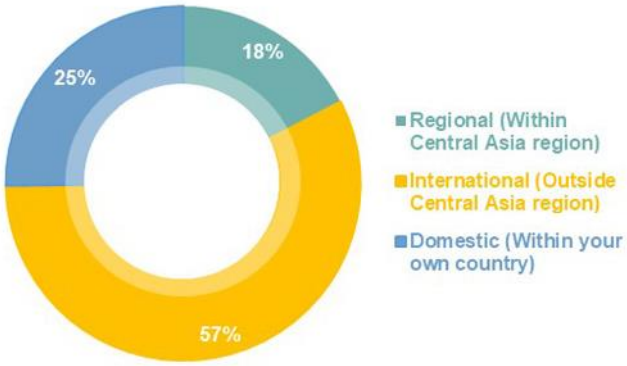
### Services provided by tour agency



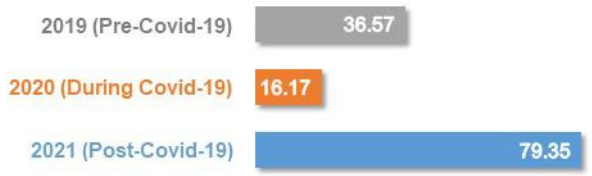

### Online presence of the Tour agency




### Primary customer source of the business

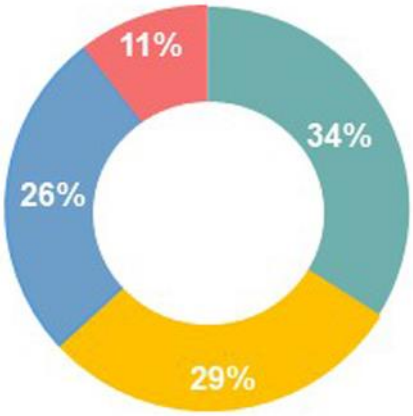



### Present/expected booking rate in the respective periods

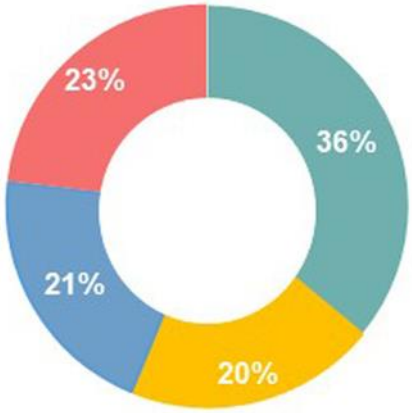



### Mode of booking

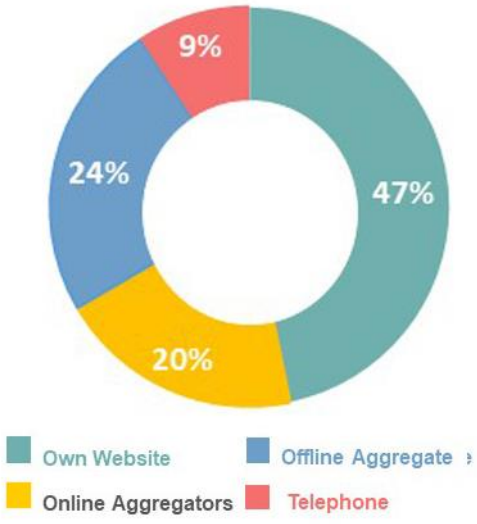
#### 2019 (pre Covid-19)




#### 2020 (During Covid-19)

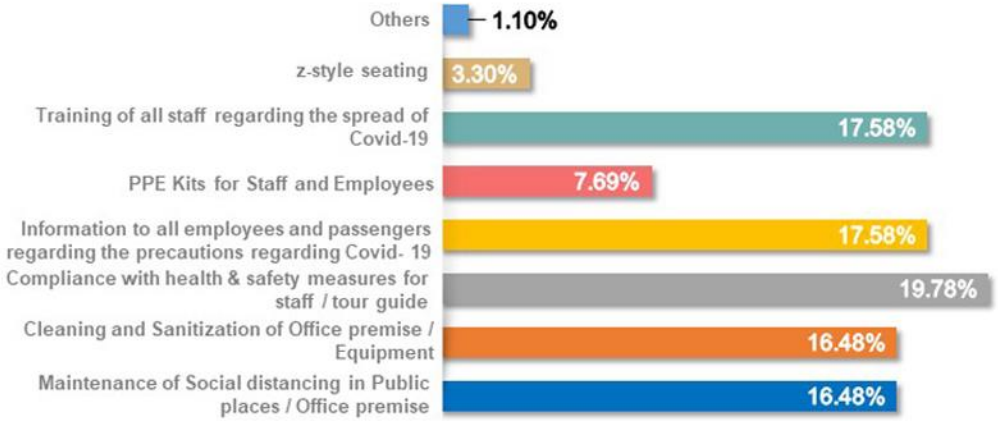



#### 2021 (Post Covid-19)

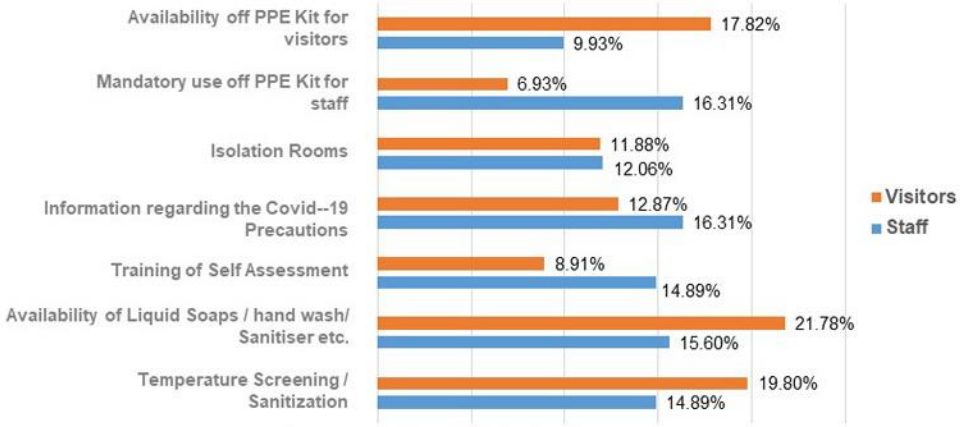


## Tour Agents

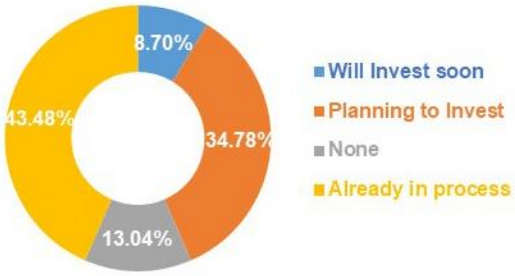
### Major concerns expressed by the Visitors



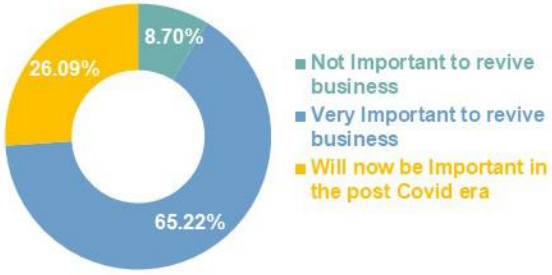

### The measures undertaken to minimize the risk of Covid-19 pandemic (Visitors & Staff)



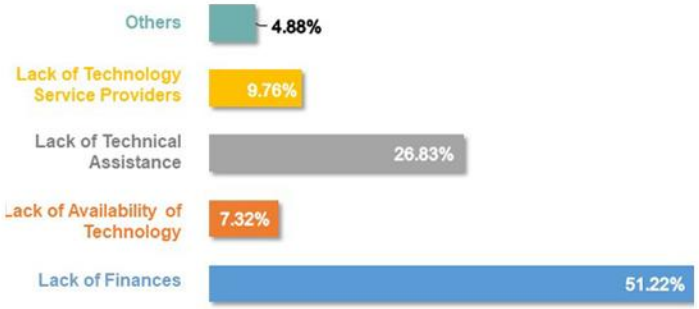

### Considering investing in Technology



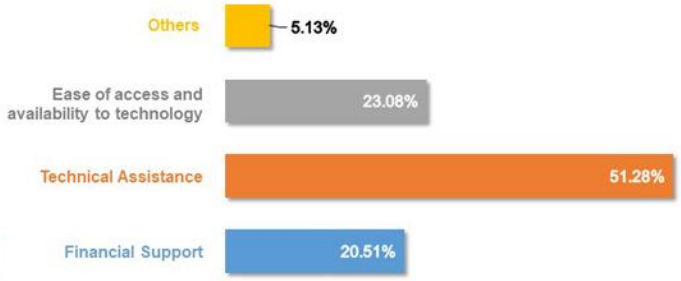

### Technology as an important factor to revive business in the post Covid Era




### Impediments faced by businesses to adopt technology

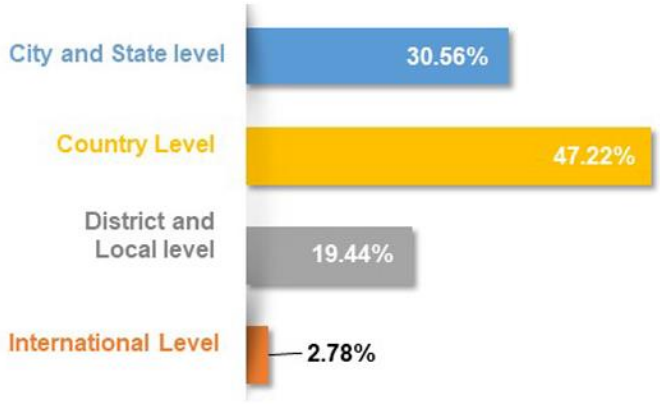



### Support needed from the government in order to adopt technology

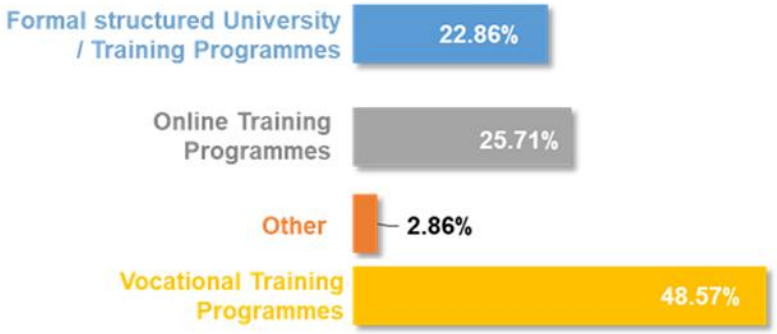


## Tour Guide

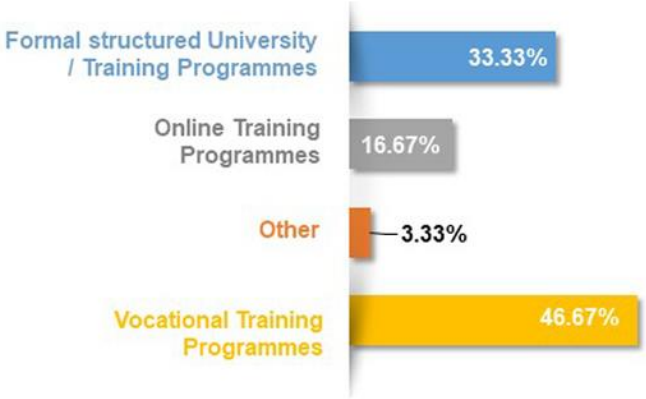
### Type of accreditation of the tour guides' and site managers services



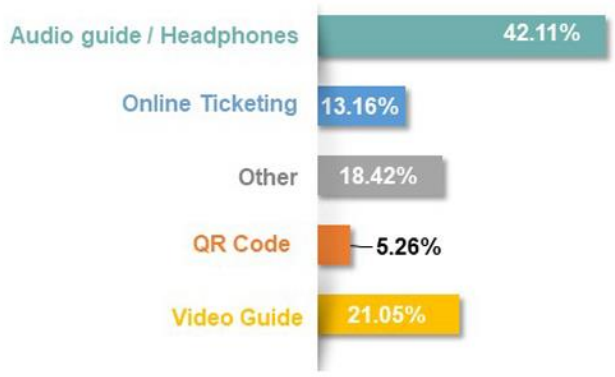

### Tour guides'/ site managers training and educational programs available




### Obtained any level of training

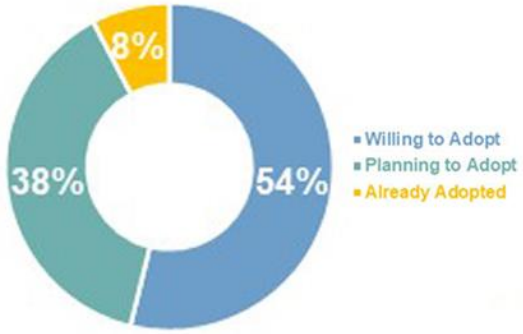



### Tools employed for the Tour guide / site management services

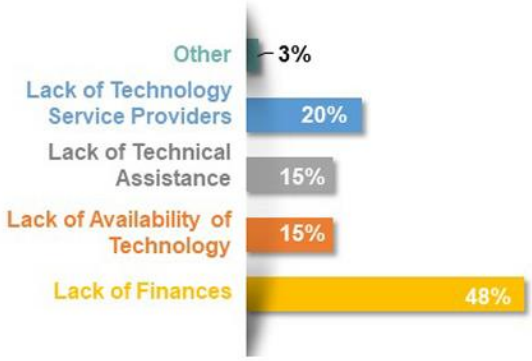


## Tour Guide

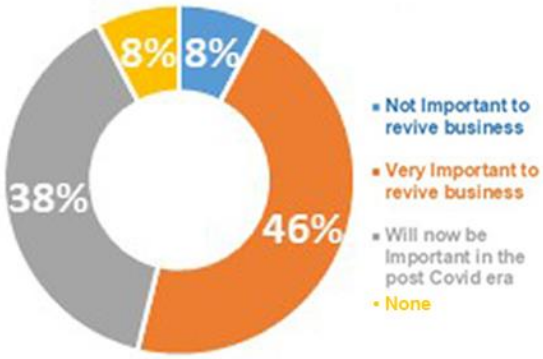
### Planning to develop programs dedicated to technology




### Impediments faced in order to adopt technology

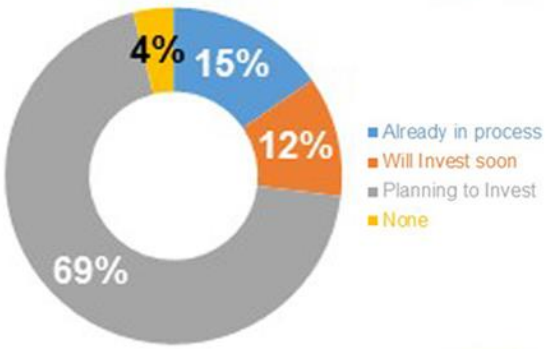



### Technology as an important factor to revive business in the post-Covid Era




### Kind of support needed from the government to adopt technology

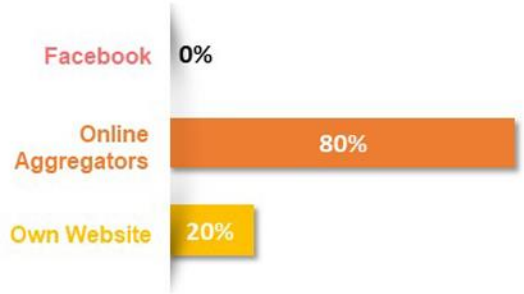

### Considering investing in technology



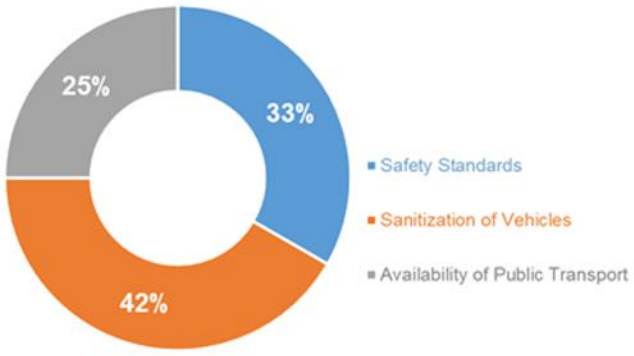
## Transport Services

### Nature of the Transport Service


### Online presence of the Transport Service

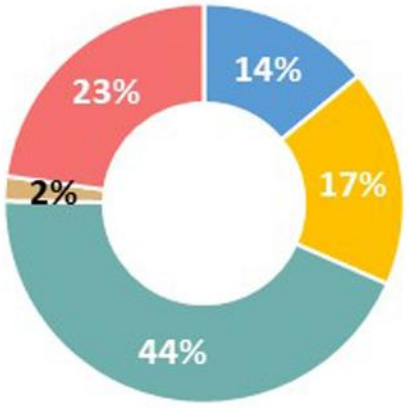



### The major concerns expressed by customers during the past 4 months

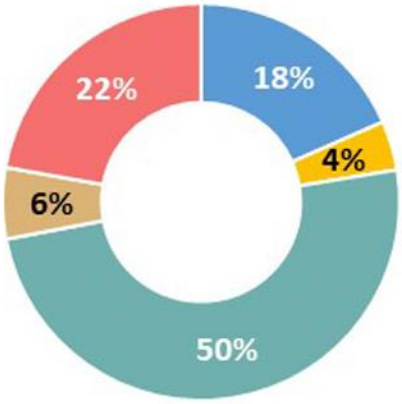



### Mode of booking

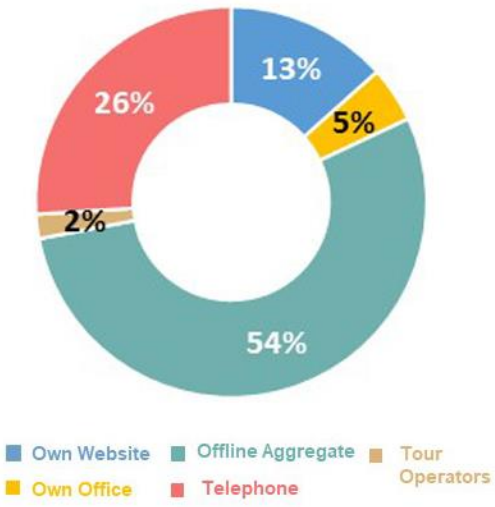
#### 2019 (pre Covid-19)




#### 2020 (During Covid-19)

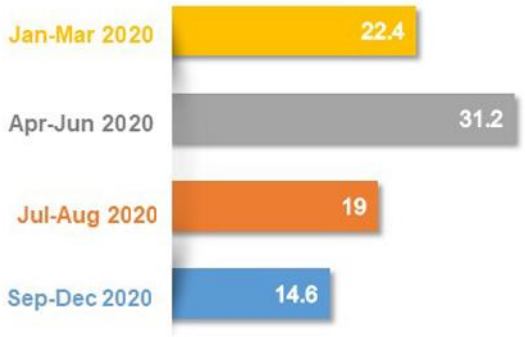



#### 2021 (Post Covid-19)

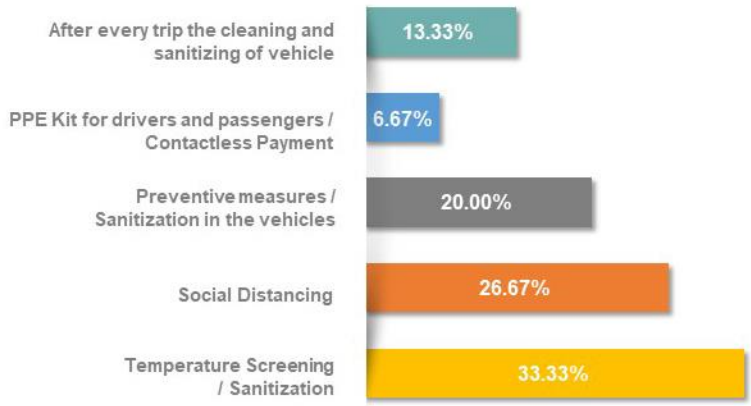


## Transport Services

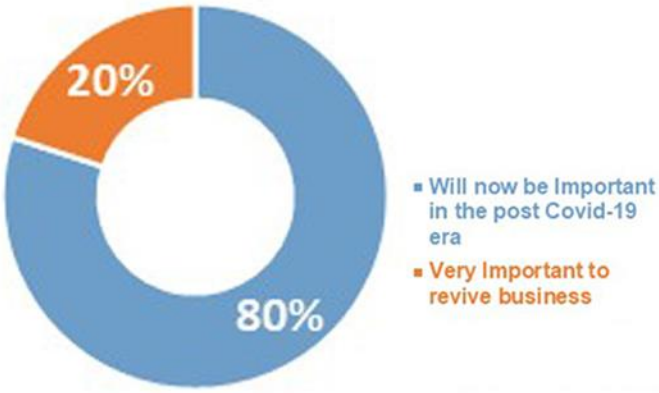
### The estimated percentage decline in your business due to Covid-19



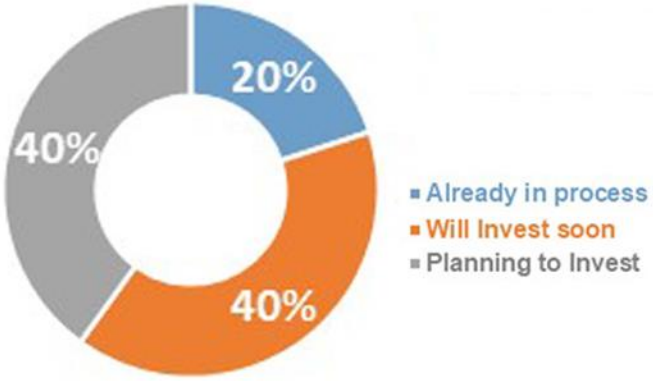

### Precautions taken to minimize the risk of COvid-19



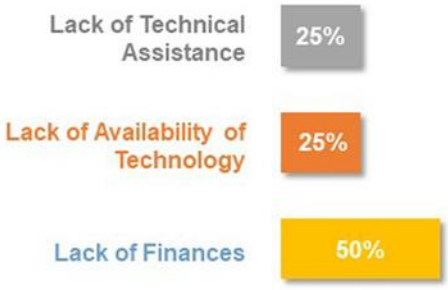

### Technology an important factor to revive business in the post Covid-19



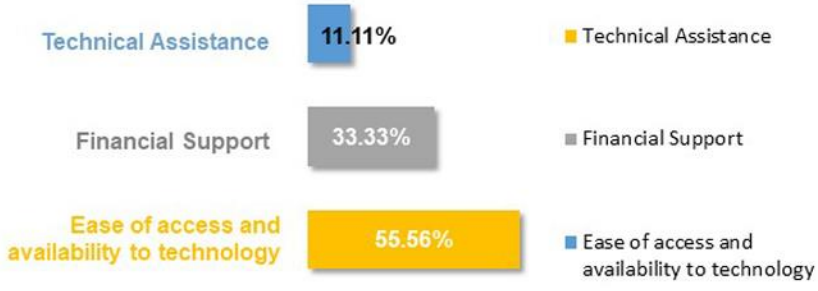

### Considering investing in technology




### The impediments faced in order to adopt technology

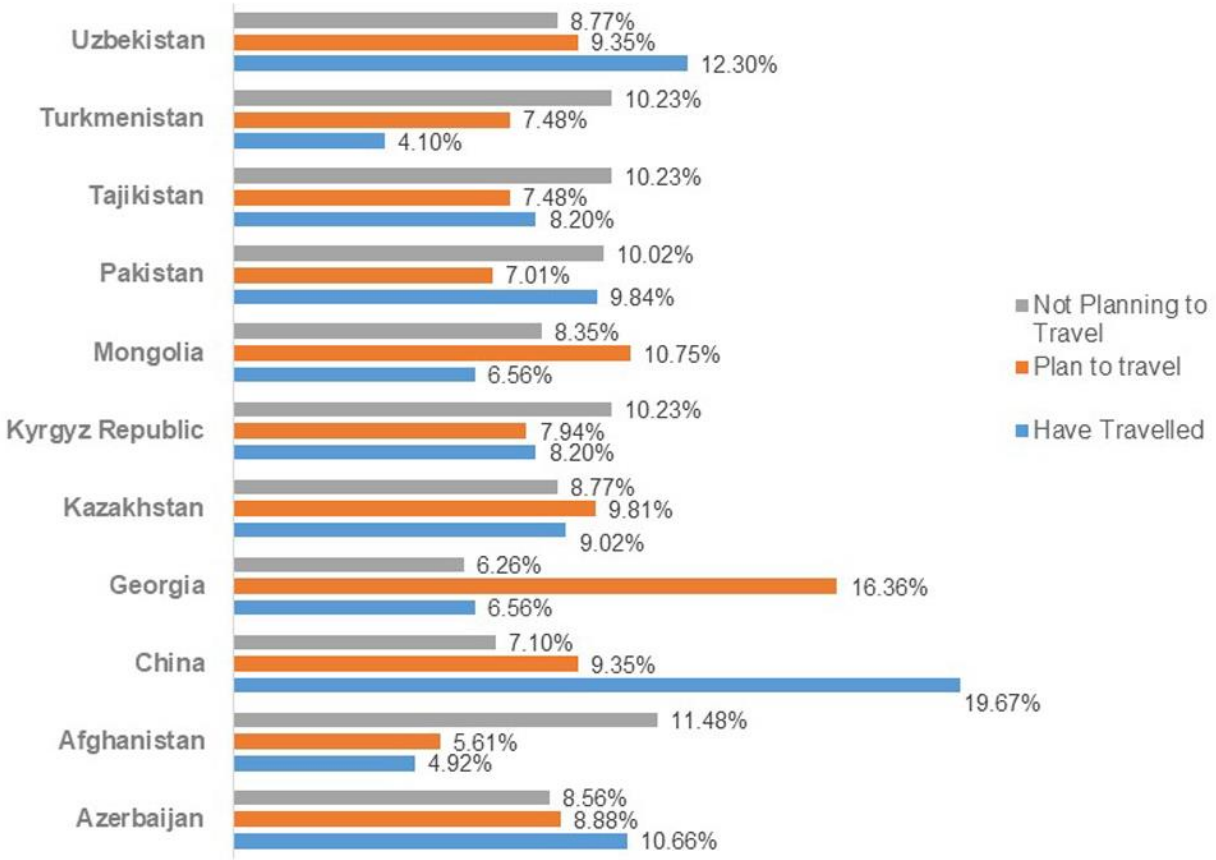



### Support needed from government to adopt technology

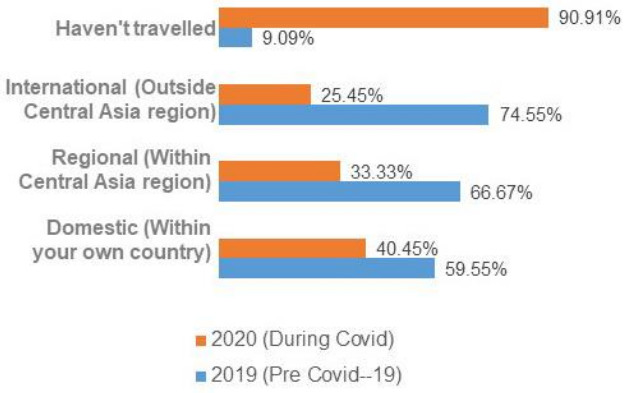


## Tourist Traveller

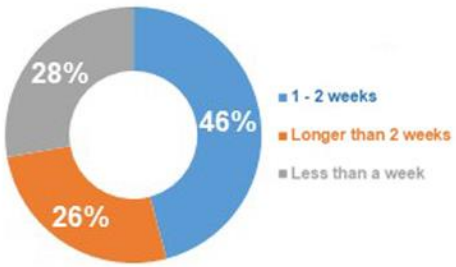
### Traveled or planing to travel CAREC Countries




### Last time travelled

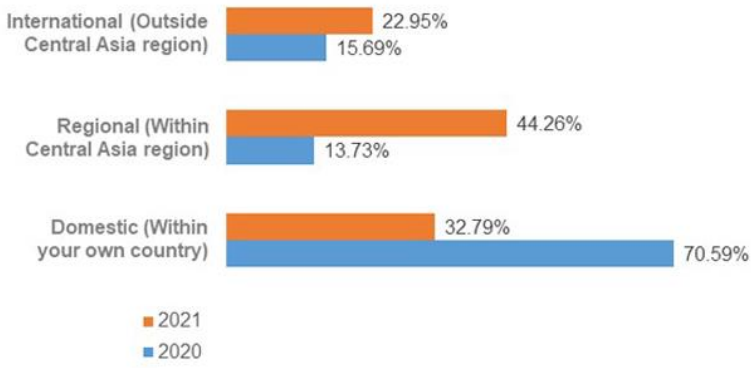



### Trips taken during 2019

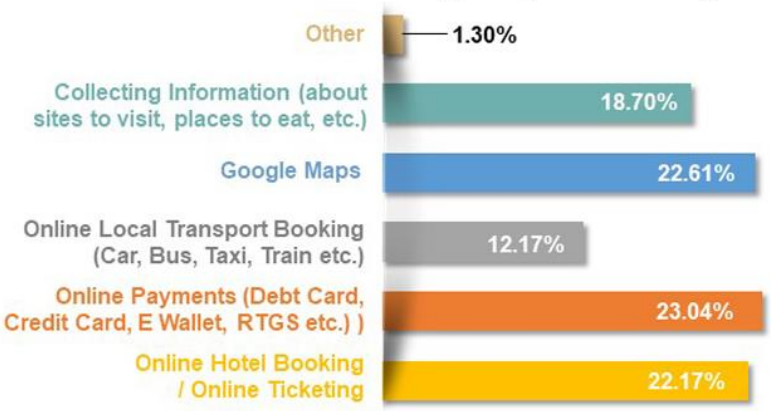


## Tourist Traveller

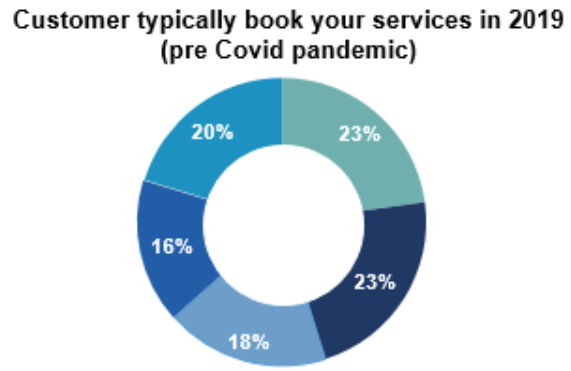
### Planning to travel next

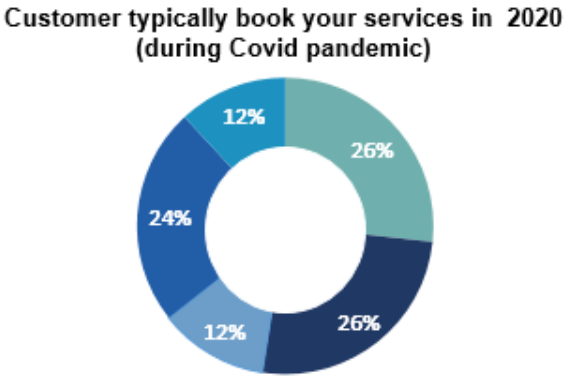


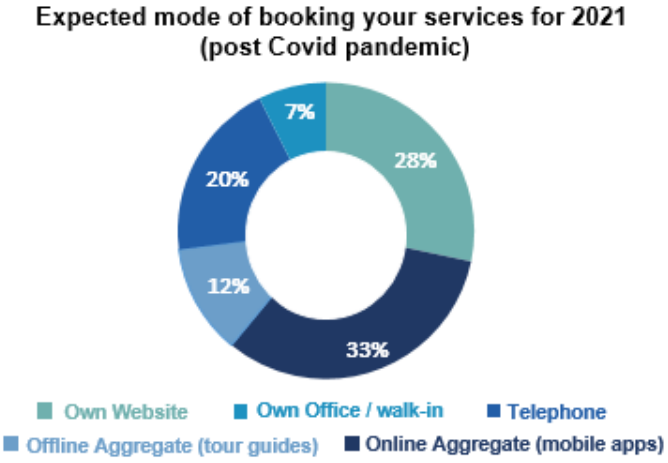

### Internet-based facilities typically used during in travel




### Key concerns in next trip




The trend shows an increase in the use of online aggregate (mobile applications) and official websites by travelers to book the services provided by stakeholders between 2019 to 2020. Service providers also expect the trend of booking their services using online aggregates (mobile applications) and websites to further increase in the post-pandemic phase. This reflects on the need to cater to the demand.

# Annexure B

## How CAREC tourism strategy actions can be supported by technology

238. *CAREC Tourism Strategy 2030* proposes a series of actions aimed at achieving the stated vision. The following section provides a summary of these actions and shows how innovative ICT can be used to support the completion of these actions. The blue shaded recommendations in the following segment contributes to the application of technology in promoting safe tourism destinations in addition to addressing the key challenges.

*Strategic Pillar 1:* **Connectivity and infrastructure**
**Key challenge:** Connectivity is key for the development of the tourism sector in CAREC countries given the landlocked nature of the region. High transportation costs, limited air connectivity, cumbersome border crossings, and poor road conditions represent major obstacles to the development of intraregional and international tourism in the CAREC region.

| ***CAREC Tourism Strategy 2030*—Proposed Actions** | **Relevant Technology Recommendations** |
|---|---|
| Improvement of air connectivity to and between CAREC countries, with development of affordable non-EU, banned air services into gateway airports and capital cities in the region. | Development of faster check-in/check-out will help with a safe and seamless airport experience through a combination of biometric technology and AI-enabled facial recognition. |
| Development and automation of visa systems and entry requirements that are common across CAREC countries. | The application of AI in processing visas should make the process easier and effective. AI along with QR codes and biometric technology should be utilized in various formats such as online appointment booking, mobile biometric services, e-visa, and so on. |
| Simplification of border crossing procedures for foreign tourists, improvement of technological means of processing people and vehicle crossings, and upgrade of infrastructure and immigration facilities. Improvement of ferry crossings between major Caspian cities for passengers and vehicles. | The development of e-border checkpoints will be the solution with automated passport control kiosks through biometrics and QR code scanner technology. |
| Improvement of road and rail connectivity to reduce travel time between tourism clusters and key tourism assets in the region. | Road and rail connectivity should be upgraded by using IoT devices. Any new infrastructural development must be connected via IoT sensors to a central control system. |
| Improvement of last-mile access, signage, information points, roadside services, and quality and availability of sanitary facilities and toilets in key tourism attractions. | Digital signage, information points, and smart roadside services should be developed through QR codes and IoT technology. Smart e-toilets should be utilized in and around tourism attractions to ensure safety and hygiene. |
| Development of a common registry of tourism assets, their content, and their management | A common network and information sharing platform should be created for content and its |

| | |
|---|---|
| to allow effective and cost-efficient use by public entities, government officials, travelers, guides, and tour operators. | management through cloud computing technology. |
| Improving basic services such as water supply, sewage, and solid residue collection, selection, and treatment in urban and rural areas around the most visited tourism assets of the priority tourism clusters. | Smart e-toilets and smart drinking water machines should be utilized in and around tourism attractions to ensure safety and hygiene. |

*Strategic Pillar 2:* **Quality and standards**

**Key challenge:** Tourism services in the CAREC region are provided mostly by small and medium-sized enterprises (SMEs), except for the international large hotel chains. SMEs do not have either the resources or the know-how to implement quality standards. Development and implementation of harmonized service quality standards aligned with international best practices are key to raising the competitiveness of the region as a global tourism destination and attracting tourists from high-spending markets.

| ***CAREC Tourism Strategy 2030*—Proposed Actions** | **Relevant Technology Recommendations** |
|---|---|
| Development of common minimum quality and hygiene standards of tourism facilities, attraction sites, hotels, restaurants, means of transport, airports, trains, and bus stations. An important first step in the accommodation system will be the implementation of the star system, which allows tourists to have an overall intuitive understanding of the expected quality level before booking. | Digital-learning apps should be utilized to develop common minimum quality and hygiene standards. For maintaining ratings and reputation management, big data and business analytics can be used. |
| Development of a system for registration of tourism business and granting of operating licenses for those businesses meeting the minimum service quality standards. | A common digital platform should be created for the registration of tourism business, where all service providers may provide minimum information about their services. |
| Development and implementation of effective regionally harmonized inspection mechanisms for tourism service providers to ensure standards compliance. | A digital non-contact inspection system should be created through cloud computing technology. |
| Development and implementation of a formal claim management system for tourists concerning tourism service providers, rewarding the best performers through effective promotion and positive reviews, and penalizing the poor service providers. | |
| Support to tourism businesses, particularly SMEs and women-owned enterprises, to increase their capacity in the implementation of quality standards and access to efficient promotional tools. | Digital marketing techniques and social media platforms should be utilized for efficient promotional support to tourism businesses. |

*Strategic Pillar 3:* **Skills development**

**Key challenge:** All CAREC countries suffer from important shortcomings with regard to tourism skills. Public sector officials need more specialized and up-to-date knowledge in the development of effective tourism policies and strategies as well as in destination management and digital marketing, standards, safety, and hygiene-related regulations, and environmental and socio-economic sustainability policies. The private sector also requires improved knowledge in the development, management, and marketing of tourism products, services, and experiences. There is also a need to improve tourism education and training systems to ensure the necessary quantity and quality of graduates that can meet both the current and future skills demand in the region.

| ***CAREC Tourism Strategy 2030*—Proposed Actions** | **Relevant Technology Recommendations** |
|---|---|
| Development of online distance learning tourism programs to allow remote educational experiences for students, enterprises, and public sector officials, with certification issued by internationally accredited institutions and organizations, allowing for international skills recognition and acceptance. | Digital learning platforms via live classes or recorded videos will be employed to achieve this. However, internet availability is a must in order to achieve this. |
| Development of common curricula and qualifications for TVET and higher education levels to allow an effective equivalence system for students who choose the TVET path and later on choose to proceed with further studies. Also the acceptance of diplomas and professional certificates of tourism professionals across countries. | A common curriculum should be prepared, and it should be taught via digital learning platforms. |
| Development of a platform that supports twinning programs between tourism educations and training institutions within the region, and knowledge sharing across CAREC countries.<br><br>Promotion of intra-regional student mobility, including work and internship placements, and faculty exchanges. | A digital knowledge platform that caters to both training and information sharing purposes should be developed.<br><br>A multilingual digital knowledge platform that caters to both training and information sharing purposes should be developed. |
| Development of train-the-trainer programs to close the gaps between industry practices and tourism education and training provision.<br><br>Improvement of the skills of tourism professionals through specialized training programs with international accreditation by reputable institutions and organizations with recognition in all CAREC countries. These could include tour guides (World Federation of Tourist Guide Associations), ski instructors (International Ski Instructor Association), and | Technical training workshops and programs will be conducted to train the trainers through multilingual learning digital media platforms created for CAREC countries.<br><br>A common curriculum should be prepared for tourism professionals covering all the necessary skills required. These programs and curriculums should align with guidelines and goals provided by international institutions and organizations. Training for the |

| | |
|---|---|
| travel agents (International Air Transport Association). | adoption of technology should be incorporated into these programs. |
| Improvement of the quality of tourism education and skills development programs in CAREC countries in alignment with international standards and best practices. This could be put into operation by setting up a joint tourism program in the region certified by the UNWTO through the Equal Certification. | These programs may be facilitated via digital learning platforms. These programs and curriculums should align with guidelines and goals provided by international institutions and organizations. |

*Strategic Pillar 4:* **Marketing and branding**

**Key challenge:** The Silk Road is the most important tourism asset shared by CAREC countries. Given its international recognition, it provides natural branding for the CAREC tourism region. One of the most fundamental needs for CAREC countries is building a perception that the countries are, both individually and in combination, destinations that (i) offer a wide range of outstanding tourism experiences with high-quality facilities and standards; (ii) are easy to reach, and travel around, in and between; and (iii) provide a safe and secure environment.

| ***CAREC Tourism Strategy 2030*—Proposed Actions** | **Relevant Technology Recommendations** |
|---|---|
| Creation and promotion of a common umbrella brand ('Visit Silk Road') through the development and management of a CAREC tourism web portal. The portal will serve as a regional tool for sharing and consolidating tourism-related information and generating traffic and business opportunities for the private sector in CAREC countries. | A CAREC tourism web portal will be developed using cloud computing and data analytics technology. With the use of cloud computing, the right information will be made available at any time to authorized stakeholders. |
| Design of marketing strategies and promotional activities on a regional and/or cluster basis aimed at reinforcing the image of the countries as safe tourism destinations to visit, restoring traveler confidence, and reactivating tourism investment and demand in the region. As domestic and regional tourism is likely to return first, marketing and promotion activities will focus on neighboring countries in the short term followed by international markets once travel restrictions are lifted. | For marketing and promotional activities of tourism destinations in the CAREC countries, big data, data analytics, and IoT technologies will be utilized in combination with service provider websites and social media platforms. |
| Development of partnerships with major digital tourism platforms to run all-year-round campaigns for the entire region in selected target markets, in coordination with offline promotional initiatives in such markets. | |

| | |
|---|---|
| Organization of international events with high promotional effects internationally (such as, Silk Way Rally) that can contribute to the brand-building process.<br><br>Promotion of affordable multicounty travel on the Silk Road through common initiatives such as a Silk Road pass. | The development of e-border checkpoints will be the solution for safe and hassle-free Silk Road tourism and organization of related international events. This should be done with automated passport and Silk Road pass control kiosks through biometrics and QR code scanner technology. |

*Strategic Pillar 5:* **Market intelligence**

**Key challenge:** Tourism intelligence and knowledge are essential for the development of targeted and innovative tourism products and services. Improving the gathering and analysis of tourism data, and statistics and knowledge of customer behavior is paramount for improving the international competitiveness of the CAREC region.

| ***CAREC Tourism Strategy 2030*— Proposed Actions** | **Relevant Technology Recommendations** |
|---|---|
| Development of common methodologies for data gathering processes and prompt production of tourism statistics to allow both public and private sectors to make evidence-based decisions.<br><br>Development of methodologies and capacity strengthening of countries to conduct surveys on customer satisfaction and spending patterns per tourist segment. | A digital platform should be created for data gathering, and information sharing and management through cloud computing technology, which will allow both public and private sectors to make evidence-based decisions.<br><br>Use of big data and data analytics for reputation management. By building on past trends of customer satisfaction and spending patterns, data analytics can greatly help in capacity strengthening. |
| Development and implementation of tourism satellite accounts (TSAs) to measure and monitor the impact of tourism policies and strategies in the national economies.<br><br>Utilization of data collection and statistics production tools powered by effective digital solutions at a regional level to allow cost-sharing across countries and achieve economies of scale. | Online web-based TSA information system will be developed for CAREC countries, which will integrate all functions of the entire TSA compilation process chain, covering data input, data storage and management, TSA table compilation, statistical analysis, and other extended digital applications. |
| Promotion of partnerships between public and private tourism stakeholders in the region for conducting joint research and analysis focused on customer behavior, preferences, desired experiences, and needs. | Tourist focused analysis should be done for all tourism stakeholders in CAREC through customer behavior analysis with the use of big data technology. Data analytics will offer deep tourism relation management (TRM) analytics, more valuable insights on tourism behavior, expectations, tastes, and wishes. |

# Annexure C

## Cluster A: Country-specific recommendations for the private sector in China, Azerbaijan, Georgia, and Kazakhstan

| Indicator | | China | Azerbaijan | Georgia | Kazakhstan |
|---|---|---|---|---|---|
| Population | | 1,392.73 million | 9.94 million | 3.73 million | 18.28 million |
| Urban population | | 59.2% | 55.7% | 58.6% | 57.4% |
| 20 year CAGR | | +4.7% | +9.3% | +16.9% | +19.3% |
| Foreign visitor arrivals | | 158,606,000 | 2,850,000 | 7,203,350 | 8,789,314 |
| Foreign arrivals in hotels | | 89,924,000 | 1,234,000 | 2,615,000 | - |
| Foreign overnights in hotels | | 243,761,000 | 2,050,000 | 10,408,000 | - |
| Foreigners' average stay | | 2.7 days | 1.7 days | 4 days | - |
| Domestic tourists | | 5,539,000,000 | 515,000 | 5,777,000 | - |
| Domestic overnights in hotels | | 439,717,000 | 953,000 | 24,874,000 | - |
| Domestic same-day excursionists | | - | - | 7,361,000 | 1,302,000 |
| Purpose of travel | | Business 12.8%<br>Leisure 33.5%<br>Other 53.6% | Business 27.6%<br>Leisure 38.2%<br>Other 34.2% | Business 8.7%<br>Leisure 42.7%<br>Other 48.6% | Business 13.9%<br>Leisure 0.7%<br>Other 85.3% |
| Main modes of transport | | Other modes 61.1%<br>Road 22.2% | Air 41.5%<br>Road 39.7% | Air 24.8%<br>Road 73.8% | Railway 20.6%<br>Road 65.5% |
| Tourism GDP | | $1,509.4 billion | $5,870.2 million | $5,690.6 million | $9,297.0 million |
| Total contribution to national GDP | | 11.1% | 13% | 33.7% | 5.7% |
| Tourism jobs | | 79,910,000 | 569,500 | 519,700 | 489,300 |
| Contribution to national employment | | 10.3% | 11.8% | 29.5% | 5.7% |
| | **Key indicators** | **China** | **Azerbaijan** | **Georgia** | **Kazakhstan** |
| Digital indicators (connections) for CAREC countries | % of individuals using internet (% of total population) | 59% | 80% | 68% | 79% |
| | No. of mobile connections (million) | 1,610 | 17.29 | 5.57 | 25.45 |
| | No. of mobile connections (% of the total population) | 112 | 112 | 139 | 136 |
| Digital indicators (ICT) for CAREC countries | ICT index (value) | 5.6 | 6.2 | 5.79 | 6.79 |
| | % of HHs with computer | 52.5% | 64.3% | 52.5% | 76.2% |
| | % of HHs with internet | 55.5% | 77.4% | 49.7% | 84.4% |
| | Individuals using internet | 59 | 80 | 68 | 79 |
| | No. of mobile connections | 112 | 112 | 139 | 136 |
| Digital indicators (social media) for CAREC countries | Social media user | 72 | 37 | 68 | 51 |
| | Facebook user | - | 16 | 62.6 | 10.18 |
| | Instagram user | - | 29 | 23.55 | 44.4 |
| | % share of Facebook advertisement audience | - | 20% | 76% | 14% |

*Source: ADB Report on Tourism Demand Analysis in CAREC Countries, 2020*

The following section provides countrywise recommendations suggested and approved by the respective governments and the public sector in the tourism industry.

**China**

1) Display key tourist-related information, in leading international languages, in all public spaces and places of tourist interest.
2) In coordination with the Ministry of Culture and Tourism (MOCT) build a smart tourism public service platform for tourists and enterprises, in all major international languages, to improve tourism information, scenic spot ticket reservation, and passenger flow warning platform, along with tourism big data integration platform.
3) Develop high-speed internet infrastructure and provide Wi-Fi access at all tourist locations in the Xinjiang Uygur Autonomous Region and the Inner Mongolia Autonomous Region at affordable rates.
4) Promote IoT facilities in tourist-intensive areas, environmentally sensitive areas, and high-risk areas within the Xinjiang Uygur Autonomous Region and the Inner Mongolia Autonomous Region.
5) Build a regional tourism industry operation and monitoring platform, establishing a data-sharing mechanism for tourism and public transportation data, statistics, and other relevant departments, and forming a tourism industry big data platform.
6) Implement 'internet and tourism' initiative to promote innovation and entrepreneurship action plan which aims to build smart tourism cities, scenic spots, tourism enterprises, and tourism villages.
7) Support the establishment of the 'internet of tourism destination alliance' aimed at standardizing cooperation between the tourism industry and internet finance and exploring a new consumer credit system.
8) Establish a tourism emergency command system (a real-time data and image collection system covering major tourist destinations, and a tourism network data hotline that is connected up, down, and horizontally to achieve emergency response to scenic spots, tourist distribution centers, routes, and regions, as well as passenger flow prediction and early warning).
9) In cooperation with local people's governments (LPGs) build a regional tourism basic database including tourism statistical yearbook, domestic and international tourism sample survey data, inbound tourist expenditure survey data, and so on.
10) Develop an effective digital marketing and branding tool for communication.
11) Improve the quality of tourism services through e-tourism—a single system of mobile applications and web portals, electronic guides, internet provided passenger trains in China.
12) Set up an innovation fund to promote and encourage the commercial application of cutting-edge technologies such as AI, IoT, and cloud computing in the tourism industry.
13) Set up a special economic zone for incubating ICT firms to promote and encourage the commercial application of cutting-edge technologies such as AI, IoT, and cloud computing in the tourism industry.

**Azerbaijan**

1) The Azerbaijan Tourism Board (ATB) to promote Baku as a tourism hub and launch a social media campaign in the region, about Baku and surroundings on major online travel platforms, in priority languages, and in coordination with local authorities.
2) Improve services provided by Baku's city sightseeing 'hop-on, hop-off' bus service through installing the audio guide service in Russian and English.
3) Offer do-it-yourself online tourism packages on websites of local tour operators.
4) Introduce self-serving visa kiosks for arriving tourists to facilitate contactless and hassle-free immigration.
5) Further improve the e-visa issuing process: the ASAN visa system will enable foreign tourists visiting Azerbaijan to obtain a visa without a tourism agency.
6) Invest in cloud technology, IoT, and AI to drive innovation in the ICT as well as the tourism sector.
7) Develop tourism investment portal to attract and incentivize investments in the tourism sector.
8) Develop electronic maps for the regions of Shaki, Guba, Lankaran, and Ganja DMO.
9) In collaboration with Azerbaijan Tour Guides Association (ATGA) design and provide audio and video guides for main tourist sites.
10) Develop a centralized e-guest registration system for all accommodation facilities in the country.[30]
11) Under the supervision of the State Tourism Authority (STA) provide financial support for projects promoting Azerbaijan in external markets using innovative solutions (new web site, platform, application, digital incoming tourism solutions).[31]
12) Increase efficiency and quality of data collection and tourism registry.
13) Increase accessibility of countries through easing visa, immigration, and border-crossing procedures for foreigners.
14) Improve the ease of doing business environment, with a focus on attracting investment from innovative tourism sector firms, which bring cutting-edge technology solutions to the country.
15) Improve the quality of tourism services such as multilingual audio guides, and electronic maps and information boards in Azerbaijan.
16) Expand and improve quality of tourism education and training with a focus on upgrading ICT skills for tourism sector professionals.

**Georgia**

1) Launch a social and digital media campaign to carry out content-oriented marketing, promotional and branding activities, including storytelling and thematic campaigns.
2) Improve the services provided by the Georgian National Tourism Administration (GNTA) in the tourism information centers through the website and social media channels.[32]
3) Create a national portal comprising websites of different resorts all across Georgia, which describes all the historical or cultural monuments, and tourist routes and activities.
4) Promote the use of modern technologies in adventure tourism to increase competitiveness[33] and promote it as an international hub for adventure sports.
5) Launch an effective digital marketing and branding campaign for communication.
6) Increase efficiency and quality of data collection and tourism registry.

30. Domestic Tourism Development Strategy of the Republic of Azerbaijan (2020).
31. Digitalization Project for Incoming Tour Operators/Travel Agencies in Azerbaijan (2020).
32. Georgia Tourism Strategy 2025 (2015).
33. Perspectives of Tourism Development in Georgia (2019).

7) Launch social media campaigns in cooperation with respective regional DMOs to promote and increase awareness about the importance and significance of the tourism industry in enhancing the livelihood of local communities by generating employment.

**Kazakhstan**

1) Develop and improve internet infrastructure and access across the country.
2) Develop ICT human resources in coordination with Kazakh Tourism National Company JSC—ICT education and technical skills to improve the talent pool for the tourism and hospitality sectors.
3) Improve the e-visa system and develop an e-hotel migration system.
4) Improve Kazakhstan travel to serve as a comprehensive national tourism web portal and platform.
5) Develop an integrated information infrastructure and web portal to promote tourism resources and products through audio guides, QR code scanning, ticketing, and virtual touring through the internet as well as mobile interfaces.
6) Make available cheap/free mobile SIMs and Wi-Fi connectivity at all major tourist sites and public spaces.
7) Launch a well-targeted and coordinated marketing and communication campaign to attract more domestic and regional tourists from neighboring countries.
8) Cooperate with online travel agencies (OTAs)—such as, Booking.com, TripAdvisor, and Lonely Planet[34]—to promote Kazakh destinations using social and digital media across the world.
9) Increase efficiency and quality of data collection and tourism registry.
10) Improve the quality of tourism services such as multilingual audio guides, electronic maps, and information boards in Kazakhstan.
11) Develop downloadable electronic guides and digitized maps for priority destinations.

34. State program for the development of the tourism industry of the Republic of Kazakhstan for 2019-2025 (2019).

## Cluster B: Country-specific recommendations for the private sector in Kyrgyzstan, Mongolia, and Uzbekistan

| Indicator | Kyrgyzstan | Mongolia | Uzbekistan |
|---|---|---|---|
| Population | 6.32 million | 3.17 million | 32.96 million |
| Urban population | 36.4% | 68.4% | 50.5% |
| 10 year CAGR<br>20 year CAGR<br>5 year CAGR | +14.2%<br>- | +5.7% | +22.1% |
| Foreign visitor arrivals | 6,947,000 | 598,000 | 5,346,000 |
| Foreign arrivals in hotels | 103,000 | - | 938,000 |
| Foreign overnights in hotels | 256,000 | - | 2,293,000 |
| Foreigners' average stay | 2.5 days | - | 2.4 days |
| Domestic tourists' arrival | 153,000 | - | 1,193,000 |
| Domestic overnights in hotels | 230,000 | - | 2,681,000 |
| Domestic average stay | 1.5 days | - | 2.2 days |
| Purpose of travel | Business 28.6%<br>Leisure 64.3%<br>Other 7.1% | Business 10.3%<br>Leisure 42.0%<br>Other 47.8% | Business 2.3%<br>Leisure 8.6%<br>Other 90.4% |
| Main modes of transport | Railway 3.5%<br>Road 96.5% | - | Railway 8.2%<br>Road 90.4% |
| Tourism GDP | $311.0 million | $1,538.2 million | $1,300.5 million |
| Total contribution to national GDP | 3.9% | 11.8% | 3.4% |
| Tourism jobs | 89,900 | 133,800 | 380,400 |
| Contribution to national employment | 3.7% | 11.0% | 3.0% |

| | Key Indicators | Kyrgyzstan | Mongolia | Uzbekistan |
|---|---|---|---|---|
| Digital indicators (connections) for CAREC countries | % of individuals using internet (% of total population) | 47% | 68% | 55% |
| | No. of mobile connections (million) | 9.73 | 4.42 | 25.14 |
| | No. of mobile connections (% of the total population) | 150 | 136 | 76 |
| Digital indicators (ICT) for CAREC countries | ICT index (value) | 4.37 | 4.96 | 4.9 |
| | % of HHs with computer | 21.4% | 23.59% | 43.87% |
| | % of HHs with internet | 18.76% | 23.57% | 75% |
| | Individuals using internet | 47 | 68 | 55 |
| | No. of mobile connections | 150 | 139 | 76 |
| Digital indicators (social media) for CAREC countries | Social media user | 39 | 68 | 9.6 |
| | Facebook user | 9.42 | 64.6 | 3.31 |
| | Instagram user | 32.4 | 12.9 | 6.92 |
| | % share of Facebook advertisement audience | 13% | 90% | 14% |

*Source: ADB Report on Tourism Demand Analysis in CAREC Countries, 2020*

The following section provides country wise recommendations for governments and the public sector in the tourism industry.

### Kyrgyzstan

1) Improve the electronic visa system launched in September 2017.
2) Develop an electronic register of tourism sites in close coordination with the Kyrgyz Tourism State Enterprise (2019) under the Ministry of Culture, Information and Tourism (MCIT) providing comprehensive information about tangible and intangible cultural assets that are of interest to tourists.
3) Organize electronic information boards in Russian and English languages at all international airports.
4) Provide free Wi-Fi connectivity at all major tourist sites and public spaces.
5) Improve cross-border procedures through innovative digital technologies to increase the throughput capacity of the border-crossing and immigration check posts.
6) Promote the positive reviews and content posted by media influencers, celebrities, and foreign bloggers,[35] using social, digital and conventional media channels.
7) Develop and launch an effective digital marketing and branding communication campaign.
8) Increase efficiency and quality of data collection and tourism registry.

### Mongolia

1) Develop and implement a policy for the promotion of religious, cultural, sport, and adventure sites and circuits to promote trips and tours, especially during the low season, using innovative technological solutions.
2) Create a national integrated tourism database listing all tour circuits, destinations, and sites.
3) Create a mobile application for both domestic and foreign tourists to provide the latest and correct news and real-time information.
4) Implement GPS-enabled maps and apps for domestic and foreign tourists to easily find their locations and identify nearby areas of interest, and places to eat, stay, shop, and so on.
5) Establish a national electronic tourism library/repository in coordination with the National Tourism Centre (NTC) under the Ministry of Environment and Tourism, where all tourism-related and relevant international and national research papers, reports, data sets, and publications can be stored and easily accessed by authorized tourism stakeholders.
6) Implement a system issuing electronic visas to tourists, making it possible to obtain visas from border points, and providing electronic travel visas to tourists. This may also be done using smart GPS-enabled immigration visa cards.
7) Launch a major social and digital media campaign to promote Mongolia as a safe country to visit, providing unique options such as nomadic travel trips, showing detailed routes, transit points, availability of public amenities, options for accommodation and food, and so on.
8) Create a national database in cooperation with the Mongolia National Tourism Organisation (MNTO) of all private tourism stakeholders—hoteliers, restaurant owners, tour operators, creative industry people, and so on.
9) Improve the quality of tourism services such as multilingual audio guides, and electronic maps and information boards in Mongolia.

35. The Tourism Development Program of the Government of Kyrgyzstan for 2019-2023 (2019).

**Uzbekistan**

1) Develop a multilingual web portal for the sale of tickets and convenient transfer connections across all transport systems—bus, air, and rail—with the mobile interface.
2) Develop electronic tourist maps and place them on tourist portals.
3) Create 3D models of attractions and use VR and AR for key tourist cities such as Tashkent, Samarkand, Bukhara, Khiva, and Shakhrisabz.
4) Launch a well-targeted and coordinated marketing and communication campaign to attract more domestic and regional tourists from neighboring countries.
5) Simplify the permissions process for the import and use of unmanned aerial vehicles and drones by media and creative groups for the preparation of photo and video materials about the history and tourism potential of the country.
6) Electronic registration of foreign visitors through the e-mehmon system.
7) Improve e-visa and immigration control systems at airports.[36]
8) Develop an effective digital marketing and branding tool for communication.
9) Increase the efficiency and quality of data collection and tourism registry.
10) Formulate a board of experts and consultants under the supervision of the State Committee for Tourism Development (UzbekTourism) to provide ratings on progress and compliance in the implementation of the best global guidelines and protocols.

36. The Decree of the President of the Republic of Uzbekistan on Additional Measures for Accelerated Development of Tourism in the Republic of Uzbekistan (2019).

## Cluster C: Recommendations for Pakistan, Tajikistan, Turkmenistan, and Afghanistan

| Socio-economic features and tourism data | Pakistan | Tajikistan | Turkmenistan | Afghanistan |
|---|---|---|---|---|
| Population | 212.22 million | 9.10 million | 5.85 million | 37.17 million |
| Urban population | 36.7% | 27.1% | 51.6% | 25.5% |
| 10 year CAGR | +6.9% | +12.3% | - | - |
| Foreign visitor arrivals | 966,000 | 1,035,000 | - | - |
| Foreign arrivals in hotels | 9,947,000 | - | - | - |
| Foreign overnights in hotels | 13,173,000 | - | - | - |
| Foreigners' average stay | 1.3 days | - | - | - |
| Domestic arrivals in hotels | 9,947,000 | - | - | - |
| Domestic overnights in hotels | 13,173,000 | - | - | - |
| Domestic average stay | 1.3 days | - | - | - |
| Purpose of travel | Business 34.5 %<br>Leisure 13.7 %<br>Other 51.9% | Business 0.5 %<br>Leisure 7.1%<br>Other 92.3% | - | - |
| Main modes of transport | Air 79.4 %<br>Road 13.1% | Air 29.5 %<br>Road 70.5% | - | - |
| Tourism GDP | $20,098.9 million | $587.1 million | | |
| Total contribution to national GDP | 7.1% | 8.0% | - | - |
| Tourism jobs | 3,850,000 | 186,600 | - | - |
| Contribution to national employment | 6.3% | 7.6% | - | - |

| | Key indicators | Pakistan | Tajikistan | Turkmenistan | Afghanistan |
|---|---|---|---|---|---|
| Digital indicators (connections) for CAREC countries | % of individuals using internet (% of total population) | 35% | 26% | 26% | 20% |
| | No. of mobile connections (million) | 164.9 | 10.04 | 4.79 | 26.92 |
| | No. of mobile connections (% of total population) | 75 | 107 | 80 | 70 |
| Digital indicators (ICT) for CAREC countries | ICT index (value) | 2.42 | - | - | 1.95 |
| | % of HHs with computer | 16.15% | - | - | 3.43% |
| | % of HHs with internet | 22.14% | - | - | 4.8% |
| | Individuals using internet | 35 | 26 | 26 | 20 |
| | No. of mobile connections | 75 | 107 | 80 | 70 |
| Digital indicators (social media) for CAREC countries | Social media user | 17 | 7 | 1.2 | 9.4 |
| | Facebook user | 15.08 | 2.55 | 0.22 | 8.83 |
| | Instagram user | 2.92 | 5.19 | 1.07 | 1.17 |
| | % share of Facebook advertisement audience | 22 | 3.8% | 0.3% | 14% |

*Source: ADB Report on Tourism Demand Analysis in CAREC Countries, 2020*

The following section provides country wise recommendations for governments and the public sector in the tourism industry.

**Pakistan**

1) Develop a national online register for all international tourists, along with their local contact details, to assist in easy tracking, provide relevant information to, and collect information from these visitors, especially in case of any emergencies.
2) Provide paid GPS-enabled smart card visa cards, issued when the visa is granted/stamped at the time of immigration.
3) Implement a national tourism sector database to collect, compile, and report on all tourism statistical data and trends.
4) Develop high-speed internet infrastructure and access on a priority basis in all major cities/destinations of tourist interest, at affordable rates.
5) Develop an effective digital marketing, branding, and communication campaign to promote the rich culture, heritage, cuisine, and locations in Pakistan.
6) Increase efficiency and quality of data collection and tourism registry.
7) Establish a panel of experts under the supervision of the National Tourism Coordination Board to provide ratings on progress and compliance in the implementation of the best global guidelines and protocols.
8) Launch social media campaigns to promote and increase awareness about the importance and significance of the tourism industry in enhancing the livelihood of local communities by generating employment.
9) Conduct training programs through digital learning platforms aimed at adopting sustainable tourism practices. This may be implemented in partnership with the Sustainable Tourism Foundation Pakistan (STFP).
10) Promote the use of online booking aggregators, such as Trivago or Booking.com, to enable tourists to access the best deals and offers.
11) Develop offline downloadable route maps and navigation services to enable smooth transportation services for the tourist.

**Tajikistan**

1) Develop internet infrastructure and access in cities of tourism interest.
2) Improve e-visa and immigration control systems at airports.
3) Expand electronic travel and tourism services using simple technologies for hotel bookings, restaurant ordering, transport (air, bus, taxi) ticketing, and so on.
4) Develop ICT human resources—provide education and technical skills and capacity in the use of information and communication technologies to improve the talent pool for the tourism and hospitality industry.
5) Improve the comprehensive national tourism website https://www.traveltajikistan.tj
6) Support the private ICT sector for developing MIS/IT solutions, company websites, backend automation, and so on.
7) Develop e-licensing and online registry system for the tourism sector.[37]
8) Develop an effective digital marketing campaign for awareness and brand building, and promoting Tajikistan as a safe travel destination.
9) Increase efficiency and quality of data collection and tourism registry. Ensure strong ICT infrastructure is in place to enable leading global services such as Google Maps, Airbnb, and Uber to function smoothly and ease the tourist experience.

37. Tourism Development Strategy in the Republic of Tajikistan for the Period Until 2030 (2018).

10) Launch social media campaigns to promote and increase awareness about the importance and significance of the tourism industry in enhancing the livelihood of local communities by generating employment.
11) Committee of Tourism Development to develop a comprehensive web portal to provide a single electronic system for registration of hotels, restaurants, and other tourism products and services.

**Turkmenistan**

1) Launch a major regional social and digital media campaign to promote eco-tourism, agri-tourism, and the coastal tourism assets of Turkmenistan.
2) The State Committee of Turkmenistan for Tourism to develop a comprehensive web portal to provide a single electronic system for registration of hotels, restaurants, and other tourism products and services.
3) Develop a central electronic payment system that visitors can use to pay for tourism products and services, even from MSME.
4) The State Committee of Turkmenistan for Tourism to promote the use of relevant information technologies to be used by tourist companies for widescale advertising of tourist services and products, highlighting their features, and improving selling methods and post-sale monitoring and evaluation.[38]
5) Develop a web portal for the sale of transport tickets and convenient transfer connections across all transport systems—bus, air, and rail—with the mobile interface.
6) Develop downloadable electronic tourist maps and promote them on tourist portals within and outside the country.
7) Simplify the permissions process for the import and use of unmanned aerial vehicles and drones by media and creative groups for the preparation of photo and video materials about the history and tourism potential of the country.
8) Improve e-visa and immigration control systems at airports.
9) Develop an effective digital marketing and branding tool for communication.
10) Increase efficiency and quality of data collection and tourism registry.
11) Ensure strong ICT infrastructure is in place to enable leading global services such as Google Maps, Uber and Airbnb to function smoothly and ease the tourist experience.
12) Train and increase awareness for local populations, via information-sharing networks and digital media platforms, to build a more inclusive approach to the future development of tourism in Turkmenistan.

**Afghanistan**

1) Develop strong internet infrastructure and access in cities of tourism interest.
2) Improve e-visa and immigration control systems at airports.
3) Expand electronic travel and tourism services using simple technologies for hotel bookings, restaurant ordering, transport (air, bus, taxi) ticketing, and so on.
4) Develop ICT human resources—provide education and technical skills and capacity in the use of information and communication technologies to improve the talent pool for the tourism and hospitality industry.
5) Develop an effective digital marketing and branding tool for communication.

38. National Programme of Support and Development of Tourism in Turkmenistan for 2011-2020.
*documents of Afghanistan are not available.

6) The Ministry of Information and Culture through its Directorate of Tourism Regulatory Affairs in Afghanistan to develop and implement media tourism strategies to promote historical and ancient destination tourism using social and digital media.
7) Afghanistan Tourism Organization (ATO) may launch social media campaigns to promote and increase awareness about the importance and significance of the tourism industry in enhancing the livelihood of the local communities by generating employment at historic destinations.
8) Increase efficiency and quality of data collection and tourism registry.
9) Ensure strong ICT infrastructure is in place to enable leading global services such as Google Maps, Uber and Airbnb to function smoothly and ease the tourist experience.
10) Implement a national tourism sector database to collect, compile, and report on all tourism statistical data and trends.
11) ATO to launch a major social media campaign to promote and increase awareness about the importance and significance of the tourism industry in enhancing the livelihood of local communities by generating employment at historic destinations.
12) Conduct public awareness programs to enhance understanding and awareness about the tourism industry through social media and other digital platforms.
13) Train and increase awareness for local populations, via information-sharing networks and digital media platforms, to build a more inclusive approach in the future development of tourism in Afghanistan.

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