



Reinventing the "tourism of tomorrow" and going beyond tourism "as we know it" is going to require shared critical academic reflections conveying actions and practices that stimulate greater sustainability and responsibility, both in the field when we collect data and in the classroom when we lecture. This volume draws together the scientific efforts of several geographers who continued to pursue research in the field of tourism while the planet was at a standstill and global tourism suspended for over a year. It presents a diverse selection of case studies and offers insightful observations with regard to the unknown future trajectories of tourism in post-COVID times.

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STUDI E RICERCHE SUL TERRITORIO



FROM OVERTOURISM TO UNDERTOURISM

Sustainable scenarios
in post-pandemic times

**STUDI
E
RICERCHE
SUL
TERRITORIO**
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FROM OVERTOURISM TO UNDERTOURISM

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SMART TOURISM

Innovation, practices, resilience

Monica Morazzoni, Giovanna Giulia Zavettieri¹

The tourism sector has long been faced with the problems of overtourism, land consumption, and the sector's particular dynamism, which demands the continuous transformation of tourist destinations (TDs). Furthermore, since 2020, the unexpected COVID-19 pandemic has been fuelling a radical revisiting of long-consolidated tourism strategies, bringing to the fore the related notions of "physical spaces dedicated to leisure" and the "digital and mental spaces of tourists" (Global Wellness Institute, 2018). We are seeing the sector take a new direction, in relation to both choices of holiday and leisure destinations and patterns of tourism development based on innovation, or on the Schumpeterian concept of "doing something new" but not necessarily innovative (Schumpeter, 1928; Schumpeter, 1935). Innovation is a creative response that spreads across a territory and may be said to occur every time «[...] something is done that is outside existing practice» (Schumpeter, 1971, 76). For example, "new tourism" or catering for current needs by providing individual *ad hoc* services, may be classified as "innovation" that based on the development of targeted offerings (not always or necessarily by niche segments of the tourism supply) or on sustainability (and not solely in ecological terms).

Tourism innovation is first and foremost "experience of", and as such it brings into play both cognitive elements (aimed at making a tourism "product" appropriable at the perceptual, rational, and emotional levels) and subjective factors (Grandi & Dallari, 2010). "Experience" technologies are a medium for meeting travellers'

¹ Although this chapter was jointly conceptualized by the two authors, Sections 1 and 3 were drafted by Monica Morazzoni and Sections 2 and 4 by Giovanna Giulia Zavettieri.

need for information and interaction (Pesoner & Horster, 2012), through which it is possible to offer mobility services, link tourist services to specific communities (Mangano & Ugolini, 2017), encourage online bookings, publicize the cultural offerings of destinations, set up virtual communities, interact with local communities, and much more.

The individual quest for wellbeing and “happiness” – represented as a “mental state” that may be attained by resetting one’s approach to life and, therefore, also to leisure – will push the tourism sector (post-COVID-19) to introduce further innovative services with the capacity to deliver unique sensations (Sacchi, 2020; Zecchi, 2015; Hoffman & Coste-Maniere, 2011). This will come about thanks to a creative supply that is sensitive to sustainability, ethical considerations, aesthetics, and local area participation and needs (Luippis, 2016). Tourist experiences are expected to generate excitement and amazement and, as a knock-on effect of the COVID-19 emergency, to offer personalized services promoting the recovery of individual health and wellbeing. The post-COVID-19 tourist, according to recent sectoral studies (Osti & Goff, 2021), will tend to pursue a healthy and sustainable lifestyle, including by means of medical wellness programs². Leisure stops thus become a privileged opportunity to engage in healthy practices and behaviours that are informed by a principle of co-responsibility and that prioritize local area resources and ties, proximity tourism, and selective socializing (the so-called bubble community), both on- and offline.

Even the issue of safety, which is not new to the tourist industry, is – as of 2021 – crucial, both for health reasons related to the COVID-19 pandemic and in light of factors relating to future ways of engaging in tourism³. “Traceability” will, in the near future, allow travellers to verify all aspects of their vacation (before, during,

² In the summer of 2020, a group of hoteliers in the renowned Alpine resort of Cortina d’Ampezzo launched the health and wellbeing programme “Benessere e Salute. Prenditi cura di te” with a view to reviving the concept of summer vacations in mountain settings as a healthy, relaxing places located far from cities and environmental pollution, where it is possible to regain one’s physical and mental wellbeing in keeping with the motto “health is the new wealth” (see <https://www.dolomiti.org/it/cortina/medical-wellness/>). Many urban (e.g., NYC) but also non-urban settings have seen an increase in luxury escape / spa venues, some of which offer a multisensory environment designed to stimulate relaxation via imaginative art and immersive technologies.

³ The COVID-19 emergency has drawn a line in the sand between the “golden age of global tourism mobility” and that of local tourism.

and after) and enable the TTD to acquire a digital identity for its entire life cycle⁴. On and offline, these systems will cumulatively combine to maximize the visibility of the resources offered by tourist destinations, including their heritage assets (which will be presented in a way that is contemporary, up-to-the-minute, and in dialogue with the future). They will also enable tourists to explore spaces virtually in advance of going there, amplify physical experience via augmented reality, or simply convey information in an engaging way.

Traceability, balance, bubble community, lifestyle of health, and sustainability will all be new keywords for the tourism sector, along with eco-experience or eco-luxury, where the cost (but also the choice) of a holiday will be determined by the “ecological footprint” left by the tourist or the level of exclusivity of the tourist experience. Some European capitals are already moving in this direction. Vienna, for example, has created an app that gives “Kultur-Tokens” to visitors who have behaved respectfully towards the environment: “in exchange for actively reducing CO2 emissions by walking, cycling, or using public transport, they receive a virtual token that they can exchange for tickets to renowned cultural institutions” (<https://digitales.wien.gv.at/en/projekt/culture-to-ken/>). In Northern European countries, the practice of rewarding tourists who commit to low energy consumption during their holiday is becoming increasingly popular (<https://inhabitat.com/eco-resort-in-finland-charges-guests-based-on-their-carbon-emissions/>).

In the literature too, many scholars underline the strategically important relationship between 4.0 technologies and tourism (Govers & Go, 2004; Gretzel et al., 2004; Buhais, Amarangana, 2015; Lopez de Avila, 2015; Lazzeroni, Morazzoni, 2020), advocating for virtual, immersive environments that facilitate independent interaction with and exploration of a destination, alongside physical environments characterized by innovative tourism offerings (Platanina & Privitera, 2011). The use of 4.0 technologies

⁴ An initiative already present, for example, in the field of clothing, is the CircularID application which reads the QR code of a garment and assigns it a digital identity that remains associated with it for its entire life cycle. The goal is to facilitate a new business model and to promote innovative modes of commerce sustainable that are sustainable for the environment, society and economy, while representing viable alternatives to fast fashion (see <https://observatorio.c-quadra.it/con-circularid-ogni-indumento-ha-sua-digital-identity-card/>).

will become an increasingly crucial competitive factor for tourism “products” and the reterritorialization of TIDs, given the power of the digital to promote local areas and destinations (via Internet, social networks ...) and facilitate direct contact between supply and demand (Manente & Cerato, 2000, Gretzel et al., *op. cit.*). Cohen (2012), in particular, identified multiple dimensions that can contribute to the tourist smartness of a local area (smart governance, smart environment, smart mobility, smart economy, smart living, smart people), all of which can help to make a destination more competitive, while also enhancing residents’ quality of life (Boes, Butalis & Inversini, 2015). A smart destination possesses a technological infrastructure that fosters sustainable development, accessibility, and interaction/integration between visitors and the local environment, thus improving both the quality of tourist experience and the living conditions of the local population (Lopez de Avila, *op. cit.*). Human and social capital, along with technological innovation, are essential components of smart tourism smartness; according to Rong (2013), they promote a higher quality tourism experience, while facilitating the efficient allocation of tourism resources and integration between tourism operators at the micro and macro levels, as well as ensuring that the benefits of tourism are equitably distributed.

In the global post-COVID-19 scenario, new tourism development paradigms will take hold across local areas and destinations: on the one hand, this will make the role of technologies and their impact on tourism, society, and mobility more complex; on the other hand, new forms of resilience will emerge, whose role in the already complex organization of tourism will need to be taken into account, as we go on to discuss in the next sections of the chapter.

The “Janus” nature of post-COVID resilience-based tourism: combining tradition and smartness

A disease-induced crisis is nothing new in tourism. The tourism industry has faced similar scenarios in the past, although none have been as damaging as the current emergency. This sector will not look the same after the pandemic, and both industry and government have a role to play in the recovery efforts (Assaf & Scuderi, 2020). A resilience-based framework is required to revive the global tourism industry and facilitate its struggle to transform itself, in keeping with a new global economic order.

Sustainable tourism, societal wellbeing, and action to address climate change are the cornerstones of the new world order in tourism. Hence, the goal of STDs today is to offer strategies that will help the tourist industry adapt to the new “normal” that is expected to follow the present pandemic (Assaf, Scuderi, *op. cit.*).

By its nature, the tourism industry is “ambidextrous”, and this is why Sanchez and Adams (2008) evoked the figure of Janus to describe the sector, given that its every positive impact has a corresponding negative one (Seraphin & Dosquet, 2020). Two-faced Janus, in fact, symbolizes change and transition from one state of being to another. He is the slow unfolding of the past towards the future, but not in the sterile sense of “progress” as it is often interpreted in the modern age, but rather in the sense that the here and now is both yesterday and tomorrow.

Janus, therefore, is not only simultaneously the passage from one state to another, but also the fixity and immobility of the clear and constant present. Hence his omnipresent role in the religion of ancient Rome, at all moments of transition from one condition to another, to death and new beginnings.

Tourism, similarly to Janus, contemplates the future with one face, using technology, while looking at the past and traditions with the other face. On the one hand, technology helps to avoid contact and streamlines booking and cancellation procedures. But on the other hand, at this historical moment in time, it is tradition that wins out, the return to a type of tourism that seeks nature, looking to the mountains, to a second home.

As earlier stated, this form of tourism is known today as wellness tourism, or “the act of traveling for the purpose of physical or psychological wellbeing” (Stainton, 2020). In practice, the form of wellness travel par excellence is certainly mountain tourism. Indeed, Arcaro et al. (2018) explain that locations such as Alpine destinations attract visitors seeking good quality air. For Seraphin and Dosquet (2020), in the context of the post-COVID-19 blockade, mountain tourism (which by default involves mobility) may be viewed as a form of placebo. These scholars hypothesized that individuals view returning to nature as essential to their wellbeing, while mountains are strongly associated with nature, purity, wilderness, and healthy lifestyles (Bourdeau, 2008).

The COVID-19 emergency has prompted people in many countries to move to their second homes or to take refuge in a safe environment away from major centres of population (Muller, 2008). This is a return to the origins of the tourism industry, given that

one of the earliest forms of tourism was related to health (Lickorish & Jenkins, 1997).

Another up-and-coming trend will be traveling while working. Following the COVID-19-induced "discovery" of the potential to work from home, which applies to many sectors and professions, it was understood that it is not necessary to carry out one's work from a fixed location. Business trips can be extended to include moments of leisure, and vice versa.

Booking.com conducted an online survey in July 2020 with 20,934 participants from 28 countries around the world⁵. They found that making greater use of technology makes tourists feel calmer while preparing to travel and safer during a trip. Thanks to travel apps, travellers can easily and remotely manage the cancellation and rescheduling of reservations, including at the last minute. This confirms the ongoing gradual shift from personal to technology-mediated interaction, with the effect of limiting contact. This can also be seen in the widespread use of check-in kiosks and bank transfer payments (Assaf & Scuderi, 2020).

In the long run, automated technologies, robots, and artificial intelligence can help tourism facilities to reduce fixed costs, improve liquidity and resilience, and meet physical distancing requirements (Assaf & Scuderi, 2020). During COVID-19, society received invaluable help from the tech industry. Robots replaced people, mobile phone applications were used to trace people's contacts, and predictions based on COVID-19 Big Data analytics spread among the masses. A leading strength of technology is its power to connect people without any physical contact. Thus, technology has the capacity to handle pandemic-specific problems such as implementing traveller screening, COVID-19 case track and tracing, online education for students, etc. (Hall et al., 2020).

⁵ The survey was administered to a sample of adults who had made at least one trip in the previous 12 months and had at least one planned in the following 12 months. Almost all the participants (95%) reported searching online for travel-related inspiration and content. The tourism of the future will be more mindful of, and more attentive to, its impact on the territory and local communities. Destinations will change too: classic and exotic travel will make a comeback, but local travel and lesser-known destinations will be more strongly appreciated than before. The survey outcomes confirmed the importance of contact with nature and the need for relaxation. Also noted was the importance of traveling with family and pets. Another interesting element that emerges from the survey is that tourists intend to spend more money on travel insurance in the future. Among the must-haves of travel going forward are safety and cleanliness, to which more attention will be paid in the future.

Many reports show an increase in public confidence in technology, a greater willingness to connect, and a greater readiness to view technology positively. People have now started ignoring privacy concerns to gain technological advantage (Stankov et al., 2020). Gretzel et al. (2020) presented the "six pillars of transformative e-tourism research" for introducing changes to e-tourism by proactively using IT resources for short- and long-term purposes. These authors called for transformative research on e-tourism, not based on a view of IT as an indispensable *conditio-sine-qua-non* for the survival of tourism, but rather as a key to understanding the new conditions shaped by the pandemic, and – in light of these conditions – to managing the journey forward together day by day, while imagining a better future for e-tourism both as a phenomenon and as a field of investigation. Specifically, they speak of an e-tourism that is:

1. mindful of the past and the value of continuity (historicity);
2. aware of the factors that influence knowledge creation (reflexivity);
3. explicit about its values (transparency);
4. sensitive to differential opportunities to participate in research and to varying impacts of its findings (equity);
5. open to diversity in topics and approaches (plurality);
6. willing to break boundaries and be prescriptive (creativity).

Again, we see echoes of Janus in post-COVID-19 tourism, and specifically, in its looking to the future with creativity while strenuously upholding and safeguarding the assets of the past.

Post-COVID-19 recovery: the prospects for European smart tourism destinations

In 2018, the European Commission Directorate General for Internal Market, Industry, Entrepreneurship and SMEs launched a scheme for rewarding innovative and smart tourism in European Cities. The European Capital of Smart Tourism project recognises outstanding achievements by European cities as tourist destinations across four categories: sustainability, accessibility, digitalisation, and cultural heritage and creativity. The aim of this initiative is to promote smart tourism in the EU, network and strengthen destinations, and facilitate the exchange of best practices (<https://smarttourismcapital.eu/>).

A smart tourism destination (STD), as indicated by the European Commission, must primarily implement “innovative, intelligent, and inclusive solutions in the field of tourism”; use “its territorial, social, and human capital for the growth of its tourism sector, the prosperity of the city, and a better quality of life for its inhabitants”; offer an “enriched and customised tourism experience through valorising local assets while respecting and involving local communities” and facilitate “access to tourism services and products through new technologies, interconnectivity and interoperability of services” ([\(https://smarttourismcapital.eu/\)](https://smarttourismcapital.eu/)). Tourist smartness is therefore not defined solely on the basis of the degree of digitization achieved by the destination through ICT-based solutions and digital tools.

The STD

- should be physically accessible to travellers with special access needs, regardless of age, social or economic situation, with or without disabilities; easily reachable via a range of means of transport; and endowed with a strong internal transport system;
- should work to preserve and enhance the natural environment and resources, while maintaining balanced economic and socio-cultural development;
- should make resourceful use of its cultural heritage and creative industries for an enriched tourism experience (https://smart-tourismcapital.eu/wp-content/uploads/2019/02/2020_Fact-sheet_EN.pdf).

The cities that currently (2021) fall within the parameters established by the European Commission for smart tourism destinations are Breda, Copenhagen, Gothenburg, Helsinki, Karlsruhe, Linz, Lyon, Ljubljana, and Malaga. The resourcefulness, in terms of Schumpeterian innovation, of these cities places them in an excellent position to lead the reorganization and relaunching of tourism post COVID-19.

One of the factors in their excellence is the sharing of mobility infrastructures (in combination with pedestrian zones, electrically-powered public transport, etc.) that are organized for urban logistics with the support of infomobility services and applications that facilitate immediate use. The mobility infrastructures are extensively digitized and sensorized to enable the provision of advanced services built around personalization, geolocation, and real-time delivery. A high capacity for digital engagement (via smart cards, apps, social networks, digital participation platforms, etc.)

also guarantees traceability (data collection and analysis of the distribution of tourist flows within the cities⁶), e-tourism, and the creation of virtual communities to increase participatory and proximity tourism.

However, post-COVID-19 tourists are also looking to pursue a “lifestyle of health and sustainability” and, in order to be defined smart, a TD must meet further sustainability parameters concerning the reallocation of green spaces and energy transition projects targeting “zero impact”. Post-COVID-19 tourists will be more inclined to visit places that are already mindful of the need to save energy and reduce polluting emissions and, at the same time, will be interested in contributing to the “wellbeing” of the TD itself. A model example (which had already met with the approval of pre-COVID-19 tourists) is the “Green Kayak” initiative launched in Copenhagen. This scheme allows tourists (and citizens) to rent kayaks for free, in exchange for voluntarily collecting waste from the canals and city piers. Participants are also asked to share their experience via social channels in order to generate word-of-mouth publicity and promote awareness concerning standards of responsible behaviour in the TD⁷.

The accessibility criterion for smart cities refers to the resources made available by an STD to remove all psychological and physical barriers to mobility. The concept of intelligent accessibility encompasses both infrastructures that facilitate the movement of people (including disabled people) and multilingual services, personal city helpers, accessibility apps, and collaborative platforms for sharing information. Again, such good practices will favour the co-evolutionary adaptation of public spaces post COVID-19, via the revival of walkability, slow paths, experiential walks, walkscapes, and new forms of physical (and virtual) accessibility, ultimately making it easier for locals and visitors to explore and enjoy the cultural and recreational heritage of the destination city.

In Breda, for example, the cobblestones have been replaced to make the medieval city centre accessible to persons with limited mobility and wheelchair users. All neighbourhoods have been equipped with pavement ramps and guiding lines for the blind,

⁶ Lyon, under the official brand ONLYLYON, has developed a CRM (Customer Relationship Management System) in order to understand the needs of visitors, improve information management and customer experience, and suggest in real time - via dedicated apps - less busy sightseeing itineraries and less crowded venues (<https://www.onlylyon.com/>).

⁷ (<https://kayakrepubli.dk/en/diverse/greenkayak/>)

while all bus drivers have been trained in hospitality to passengers with disabilities⁸.

The streets also benefit from route planning and crowd-management tools, the latter being used to prevent large gatherings and to ensure a satisfactory level of "health safety" for tourists.

In the capital of Finland, the so-called Helsinki Helpers provide tourists and residents with information about places, events, and shopping. These are young locals who, between them, speak 14 languages and are present at the spots where tourists typically ask the most questions, that is, in the vicinity of the city's leading attractions.

The Helsinki Helpers also use their "Helper Mobile", a customized bike with a basket for carrying brochures, to serve as many visitors as possible⁹.

In Goteborg, the Accessibility App for GotEvents Arenas – which hosts fixtures from sports events to concerts and family entertainment – has been designed to make information more accessible to those with specific needs: visitors with hearing or vision impairments as well as visitors with dyslexia or neuropsychiatric impairments can be helped to experience an event as deeply as others, for example by means of interpretation services, sign interpretation, or hearing loops. The app offers flexible instead of designated seating for people with vision or hearing disabilities; sign interpretation (of sound) and live visual interpretation are available, as well as hearing loops for sound amplification and information on how to get to the arena or access assistance on site¹⁰.

Valencia, on the other hand, is a partner in Tur4all, a national scheme run by Vodafone in collaboration with the Spanish confederation of associations of persons with disabilities, PREDIF. Tur4all offers a collaborative platform for sharing information on accessibility in tourist destinations. Anyone can contribute comments across a range of categories: hotels, monuments, beaches, etc. Experts review the information and users provide their feedback via rating services. Users can filter searches according to their requirements, such as hearing loops, staff with knowledge of sign language, or the acceptance of assistance animals¹¹.

⁸ (<https://smarttourismcapital.eu/city/breda/>).

⁹ (https://smarttourismcapital.eu/wp-content/uploads/2020/03/Compendium_2020_FINAL.pdf#page=22).

¹⁰ (<https://www.goteborg.com/en/apps/>; <https://www.goteborg.com>).

¹¹ (www.tur4all.es).

In Lyon, three types of street kiosks provide visitors with information, the most important kind being "orientation tables" set up in locations that offer exceptionally good views of the area around them. The function of these tables is amplified by signposts installed on existing urban kiosks, and by specific markings on the edges of pavements. This new signage enables tourists and locals alike to find their way around independently. The network includes 11 orientation tables equipped with NFC systems (a contactless technology) and flash codes (for accessing apps). Lyon has also deployed an innovative, real-time network of digital signage called iGirouette. In less than a minute, the 15 iGirouette signposts, which are capable of 360° movement, can indicate to visitors passing by, what direction they should take to get to a place of interest, and how long it will take them to arrive there (at a museum, station, event, etc.)¹².

Finally, the fourth parameter for classification as an STD concerns cultural heritage and creativity. This criterion encompasses all measures taken to protect and capitalize on cultural heritage and creative industries. It therefore includes both actions aimed at enriching tourist experience and practices adopted to make tangible and intangible cultural heritage and its relationship with the local area more visible. Actions that have been implemented in different contexts reflect an evolving scenario in which cultural sites (archaeological heritage, museums, villages, places of worship, theme parks, etc.) are extending their boundaries and offering themselves as "dispositives" of knowledge and experience via augmented visit applications, video-mapping programs, webGIS, interactive maps, virtual tours, and much more.

Although culture should not become a mere object of tourist consumption or spectacularized, the wave of 4.0 technologies has triggered radical innovation at the intersection between the tourism sector and local resources, also favouring bottom-up cultural tourism practices¹³. The development of digital opportunities has

¹² (<https://www.imsbruck.info/en/destinations/tourist-information.html>).

¹³ A possible example is the project "Meet the Locals", which connects visitors with locals and introduces the visitor to Goteborg's daily life and the Swedish lifestyle, thereby personalizing the visitor's experiencing by offering a local perspective. Locals and visitors can meet via a variety of mechanisms, for example, via a car-sharing service, a tour of the local sights, sharing surplus fruit from a local's garden. Swedish designers making their clothes available for hire, or staying at a local's house to experience what a home in Goteborg can look like. "Meet the Locals" involves sharing at both the individual lev-

also ushered in, especially during the COVID-19 pandemic, a new era for culture in terms of cultural, economic, and social accessibility (Feinstein, 2020). Digital technologies have afforded considerable freedom of communication to museums, monuments and historical town centres as well as the opportunity to digitally reproduce the cultural heritage assets themselves. Analysis is required to identify the main issues that need to be addressed in the immediate future and the best ways of capitalizing on the potential for innovation brought to light by the current crisis.

In conclusion, it is urgent to explore the potential offered by digital technologies, especially virtual reality (Morazzoni & Paradiso, 2021), to promote cultural destinations, creating anticipation and generating interest and intention to travel. This is particularly useful for so-called “invisible” (little known and visited) destinations (Marasco *et al.*, 2017). As illustrated by Sacco and Teti (2017), the new paradigm based on digital platforms can produce significant impact via active cultural participation, in terms of increasing the visibility, credibility, and reputation of a destination. We may also conclude that the development of technologically-mediated cultural tourism experiences can make a difference when, thanks to the analysis and anticipation of the diverse cognitive, sensory, and social needs of visitors-users, it generates measurably effective solutions at all the different stages of travel (before, during and after).

Future post-COVID-19 prospects for emerging destinations: the case of Oman

In this section, rather than proposing firm conclusions, we present a series of joint reflections that allow us to hypothetically think about the future of an emerging destination that has not been dealt with in the literature. This lack of attention is partly because Smart City projects, although actively implemented in various developed cities around the world, are few in number in the cities of the Gulf Cooperation Council (GCC) and, when implemented, often suffer from a lack of coordinated planning (Samad & Azar, 2019).

el, for example locals who share their personal hobbies or interests, and the community level, for examples systems for the efficient sharing or borrowing, instead of buying, of resources (<https://meetthelocals.se/en/>).

Cities in GCC countries have a population growth forecast that is among the highest in the world – over 30 times that of European Union countries (IRENA, 2016; IEA, 2015). A transition to smarter GCC cities is therefore essential for better resource management, a higher standard of living, and a knowledge-based economy. Of course, it is not possible to develop one strategy for all the cities on the Gulf, given that they are extremely different from each other; indeed, each faces its own challenges and has its own aspirations as a function of its peculiar position, stability, economy, political leadership, level of progress, citizen readiness, and so on. What might work well as a framework for one city will not necessarily apply to another. Even within the GCC, and contrary to how it is usually perceived, the different cities and their inhabitants display relatively unique characteristics, which further complicates their route to Smart City and STD status.

Within Islamic culture, travel is of key significance. One of the five pillars of Islam is pilgrimage, which means that travel is prescribed for the majority of Muslim communities. Hatem El-Gohary (2020) cited the verses from the Quran that support and encourage Muslims to travel, eleven in all. The COVID-19 pandemic has undoubtedly disrupted all kinds of travel-related practices, and emerging destinations such as Oman, albeit exclusively associated with nature tourism, have nevertheless suffered a backlash. In the case of Oman, smartness is still at the early stages of development: strategically, 2040 has been set as the deadline for the tourism sector to significantly increase its value and become a major contributor to the economy. However, experiments are underway to implement the IoT via the development of ad hoc applications (Zavettieri, 2021), and sentiment analysis has shown that most tourists express positive opinions about Oman as a destination (Vallikannu & Meyyappan, 2019).

Geo-tourism – in the modern, British sense of tourism based on geology, centred around landforms, mines and quarries, caves, rock formations, and volcanoes (Ergasheva, 2010)¹⁴ – could offer

¹⁴ Geotourism is a term coined to reflect the rapid growth of tourism activities at geological sites. The term “geotourism” was introduced in 2002 by the Travel Industry of America and National Geographic Traveler Magazine in response to the need for more inclusive ecotourism or sustainable tourism (<https://tinyurl.com/y8ku7mny>): “geotourism” was initially understood, especially by geologists, as “tourism surrounding geological attractions and destinations” (Heggie 2009). On the far side of the Atlantic, however, a major travel survey conducted with 55 million Americans defined “geotourism” as “tourism

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