



# The pandemic of loneliness: designing smart tourism for combating loneliness

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Received: 27 June 2022 / Revised: 6 August 2022 / Accepted: 8 August 2022 /  
Published online: 19 August 2022

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## Abstract

Many technologically driven societies currently experience a “pandemic of loneliness”. The purpose of this viewpoint paper is to conceptualize loneliness as a persistent and widespread issue among consumers that has been amplified by the COVID-19 pandemic and increasingly spills over into the travel and tourism domain. This issue creates many challenges for smart tourism design as it implies changed consumer perspectives on smart tourism and needs for smart tourist experiences. This viewpoint paper is based on a review of relevant academic literature and online resources regarding the issue of loneliness, before and during the COVID-19 pandemic, and potential solutions in smart tourism settings. Loneliness has been completely overlooked by the smart tourism research agenda despite its tremendous implications for engagement, value co-creation, and the need for experience enhancement. This viewpoint paper proposes a framework for designing a loneliness-sensitive smart tourism ecosystem (LoSSTE). The purpose of this paper is to start a debate on how to mobilize smart tourism research for combating loneliness in the post-pandemic era and to outline areas for further research.

**Keywords** Loneliness · COVID-19 · Pandemic · Smart tourism · Service design

## 1 Introduction

Apart from significantly reduced general possibilities to travel, COVID-19 restrictions in terms of physical distancing and work-from-home policies brought additional collateral damage in the form of increased loneliness (Becker et al. 2022; Dahlberg 2021; Hartt 2020). Many interventions to reduce loneliness during COVID-19 have appeared including psychological therapies aimed at mindfulness (Stankov and Fili-

monau 2021) or lessons on friendship, while other approaches relied on technology, such as robotic pets, or social facilitation software, to replace or enable connections (Williams et al. 2021). Most importantly, the ongoing COVID-19 pandemic has revealed an already widespread and fast-growing, systemic issue of loneliness and an increasing ‘loneliness gap’ between the most and the least lonely people (Patulny and Bower 2022).

Loneliness can be seen as an unpleasant experience of emotional and/or social isolation resulting from dissatisfaction with the number and the quality of personal relationships (Weiss 1975). As a universal affliction, loneliness is hazardous to psychological and physical health since it disrupts thinking abilities, willpower, and body functions (Cacioppo and Patrick 2009; McGraw 1995). Apart from social loneliness (lack of embeddedness in a personal network) and emotional loneliness (lack of closeness and intimacy), the concept of existential loneliness (a realization that one is fundamentally alone) also persists, with accompanying feelings of emptiness and meaninglessness (Tilburg 2020).

Despite its many implications for travel and tourism, loneliness is currently an underresearched tourism topic, particularly in the field of tourism information technology. This is surprising given that smart tourism has a sustainability and social wellbeing agenda. Yet, its extant literature does not discuss combating loneliness as a potential positive outcome of smart tourism initiatives (Bastidas-Manzano et al. 2021; Chen et al. 2022). Smart tourism is a tourism development and destination management paradigm that seeks to take advantage of advanced information technology to achieve goals beyond traditional, exploitative economic agendas (Gretzel, 2021). The pinnacle of smart tourism development is the creation of meaningful experiences for tourists (Gretzel, Sigala, et al., 2015). To achieve this, smart tourism endeavors depend on intensive information sharing and value co-creation among an array of experience providers (Gretzel, Werthner, et al., 2015).

One of the fundamental building blocks of smart tourism is the smart tourism ecosystem in which smart tourist experiences are designed, delivered, and consumed. Smart tourism ecosystems facilitate innovation and value co-creation by providing interaction mechanisms that are more flexible than traditional tourism value chains (Gretzel, Sigala, et al., 2015). A smart tourism ecosystem consisting of various traditional and new players (Arenas et al. 2019; Schaffer et al. 2021) is necessary to take advantage of smart technologies in creating, managing, and delivering intelligent touristic services/experiences, that are also more accepting, inclusive and human-oriented (Stankov and Gretzel 2020). Guidance on how to facilitate the design of loneliness-combating smart tourist experiences within a smart tourism ecosystem is currently not available. Therefore, the aims of this paper are to (1) conceptualize the loneliness pandemic; (2) highlight its relevance in tourism contexts; and, (3) link it to smart tourism design agendas. Specifically, to address the loneliness pandemic that existed before, but has been amplified by the COVID-19 pandemic restrictions (Ducharme, 2020), this paper presents a framework that describes the elements of a smart tourism ecosystem aimed at combating growing loneliness among consumers through smart tourism offerings that enable and mediate connectedness and well-being before, during and beyond the tourism experience.

## 2 The growing issue of loneliness

Various surveys show persistent feelings of loneliness among consumers (Cigna 2018; D’Hombres et al. 2018; Griffin 2010; Surkalim et al. 2022), due to a complex web of psychological (Hawkey and Cacioppo 2010), demographic (Newmyer et al. 2022; Nicolaisen and Thorsen 2014), and socio-economic factors (Yang 2019). In particular, apart from personality predictors of loneliness (for example, introversion) and other personal characteristics (highly empathic, highly gifted) (Beadle et al. 2012; Ogurlu et al. 2018; Saklofske and Yackulic 1989), loneliness is very often associated with specific age groups, most often with the elderly population, but there are ever more studies showing that young people are also among the most vulnerable (Berg-Weger and Morley 2020). This problem is magnified within smaller segments, such as people with disabilities (Tarvainen 2020), members of the LGBTQIA+ community (Perone et al. 2020), divorced individuals (Högnäs 2020), immigrants, and other groups that experience loneliness triggered by the absence of the preferred cultural and/or linguistic environment (Sawir et al. 2008). Even lack of sleep could lead to social withdrawal and loneliness (Ben Simon and Walker 2018).

In general, loneliness can be classified as either *situational*, for instance, experienced after a stressful life event, such as lockdowns (Shah et al. 2020) and mostly manageable after a period of time, and *chronic*, a more stable state resulting from the inability to develop satisfying social relationships (Shiovitz-Ezra and Ayalon 2010). Since loneliness is a multidimensional and complex construct (Yanguas et al. 2018), different situations or significant transitions (e.g., divorce, job loss, death of a significant other, disease, relocation) can cause loneliness (Deckx et al. 2014; Fardghassemi and Joffe 2022), particularly if accompanied by personality traits that make an individual susceptible (Dill and Anderson 1999). For instance, a UK survey showed that while the vast majority (76%) of people enjoys spending time with friends and family during festive periods, 17% feel more lonely during Christmas (Populus 2018).

Loneliness is different from social isolation since the latter is objective and based on the quantitatively diminished number of people in a person’s social networks (Victor and Yang 2012). Loneliness is a subjective experience and self-reported measure (Mansfield et al. 2019). One of the significant operational difficulties in dealing with loneliness as an often overlooked health crisis is its psychosocial complexity (Yanguas et al. 2018). Further, being a self-reported measure, it sometimes has subtle manifestations and, most importantly, still carries a significant social stigma (Griffin 2010). On the flip side, loneliness is sometimes viewed more positively as solitude, a state of voluntary aloneness dedicated to personal growth, transformation self-discovery, rest, relaxation, and happiness (Berkowitz 2009; Kirillova et al. 2017). Partly fueled by these motivations, the trend of solo travel and single tourism destinations persists and grows (Bianchi 2021; Stankov et al. 2022). However, this paper focuses on loneliness in a negative sense, meaning that those who experience it perceive it as having negative consequences.

With the emergence of the Internet, social media, and the omnipresence of smartphones, loneliness seems to have gotten worse for some user groups (Jaradat et al. 2020). Although these services have been acknowledged as supporting coping strategies for individuals to manage loneliness in their daily lives (DiJulio et al., 2028),

many studies find that prolonged Internet use can lead to alienation from usual social contacts (Amichai-Hamburger and Ben-Artzi 2003; Longstreet et al. 2019). A recent study on US-based adults showed that many respondents (44%) agreed to some extent that social media usage was related to feelings of loneliness (APA 2019). It must be noted here that there are mixed views on the relationship between technology and loneliness and its effects depending on the characteristics of the users and the use (Berezan et al. 2020). Despite the growing number of online relationships and new opportunities for virtual sociality, the genuine, intimate, and emotional connections essential for personal well-being have declined for specific user groups, especially for youth (Hunt et al. 2018).

Since loneliness is associated with the mental health and well-being of individuals, it is of paramount interest during the COVID-19 pandemic (Marston et al. 2020). Many studies have found a link between social distancing and shelter-in-place measures and an increased sense of certain types of loneliness, particularly emotional loneliness (Kim et al. 2021; van Tilburg et al. 2020). Pandemic-driven loneliness is not evenly distributed across populations and therefore also raises concerns about equality and inclusion (Dahlberg 2021; Populus, 2020). Importantly, general travel restrictions especially hurt those who mitigate loneliness through tourism activities.

### 3 The relevance of loneliness for travel and tourism

The sentence “I have no one to travel with” is often heard in offline conversations or found in online travel forums. For this phrase, a straightforward Google search returns about 550,000 hits. Travelling is clearly a social activity (Tan and Lu 2019) and a vital mechanism for social connectedness (Gössling et al. 2018). Even though loneliness has been addressed as one of the tourist motivators or demotivators in tourism literature, it was not until recently that tourism researchers have recognized it as a trend that influences the tourism industry (Boschetto Doorly 2020; Gössling et al. 2018; Loveys et al. 2019). Undoubtedly, there is evidence that holiday trips can help individuals prevent loneliness (Kim and Jang, 2017; Pagan 2020). For example, the experience of social interactions between hosts and guests enabled by the AirBnB platform could be seen as a coping strategy for mitigating loneliness (Farmaki and Stergiou 2019).

At the same time, the very act of engaging in travel and tourism can trigger more loneliness than experienced in the first place (Sawir et al. 2008), or it can lead to a temporary sense of loneliness during travel, for example, on a regular business trip or in case of digital nomads (Hermann and Paris 2020) when one has to dine alone (Brown et al. 2020). The popularity of online dating apps and their relevance even when traveling (Leurs and Hardy 2019) further highlights that loneliness can be situationally triggered by or spill over into tourism. Existential loneliness is especially detrimental to contemporary tourists and their focus on meaning-seeking (Gretzel et al. 2006). Despite their disruptive potential, such existential dimensions of tourism experiences remain underexplored (Kirillova 2019).

Most importantly, the feeling of loneliness can influence consumers’ perception of travel or tourism-related activities (Farmaki and Stergiou 2019) or marketing

messages (Qin 2017). As such, loneliness becomes a factor that should be carefully managed from a business perspective. Although excessive use of technology is often considered to be the cause of an increased sense of loneliness, technology can be part of the solution, especially related to the use of personable robots and networked communications (Turkle 2011). This is also the case for tourism, where different types of social connectedness emerge from technology use (Neuhofer et al. 2015). However, many of the promising examples of using advanced technology approaches to cope with loneliness are not directed to support the achievement of specific business objectives, at least, not in the travel and tourism domain, which is significantly engaged in the various applications of smart tourism technologies (Pencarelli 2019).

One of the main arguments to add smart technology as a facilitator in coping with loneliness is that the smart tourism agenda has already penetrated various aspects of the whole tourism ecosystem, including institutional and government levels (Cimbaljević et al. 2018; Shafiee et al. 2021; Soares et al. 2020). And it increasingly blends with traditional tourist experiences and everyday life (Gretzel and Koo 2021). This mainstreaming of smart tourism also implies the need and opportunity to adopt broader agendas. Smart technologies, meaning technologies that support the realization of immersive, interactive, augmented, and context-driven experiences (Neuhofer et al. 2015), are often used in tourism ecosystems to successfully profile consumers and personalize services (Yang and Stienmetz 2018) and to enhance/amplify touristic experiences (Ivanov and Webster 2019). Yet, the enormous computational power invested in enhancing tourism experiences is rarely used for coping with fundamental and inherent problems of consumer well-being (Stankov and Gretzel 2020, 2021).

Coca-Stefaniak (2020) envisions that one of the significant challenges of post-smart tourism destinations will be to understand, empower and connect people. Thus, putting the problem of loneliness as one of the missions of smart tourism development appears to be an untapped business opportunity for the tourism domain to provide more beneficial services and experiences and to sustain the well-being of a significant portion of consumers. It also helps re-focus smart tourism discourse onto its central tenet of increasing the quality of life of residents and tourists alike (Gretzel, 2021).

#### 4 Combating loneliness with smart technologies

Many individuals actively look for strategies to cope with loneliness (Mann et al. 2017). For example, within the commonly known phenomenon of social withdrawal of Japanese youth (*hikikomori*), there is a sub-segment of those who still seek opportunities that may end their isolation (Furlong 2008), especially with the help of digital socializing (Voiskounsky and Soldatova 2019). Simultaneously, there are traditional and tech-related companies that provide services, commodities, and shopping platforms for lonely consumers providing compensatory consumption to help them deal with loneliness (Sullivan & Richardson, 2020).

Various advanced technology systems are increasingly and systematically used to help people cope with loneliness (Fox 2019; Ma et al. 2021). In addition to the classic examples of technology being used to connect people, such as location-aware

social media or dating applications, successful but contextually limited examples have emerged, such as the use of social robots for therapeutic purposes (Cifuentes et al. 2020). Smart technologies open up several new possibilities for combating loneliness to a more considerable extent, from daily life to travel.

These new ways refer to abilities for more efficient identification of lonely individuals, either by providing ways for users to directly but anonymously state and opt-in for loneliness-mitigating services, or indirectly, by using unobtrusive analytics of online activities (e.g., monitoring manifestations of loneliness on social media) or real-time observations of individual behaviour (e.g., by measuring the number and physical proximity of social interactions with the help of sensors) (Austin et al. 2016; Park et al. 2015). Simultaneously, recent advances in artificial agents, such as chatbots or embodied conversational agents, can help fight social loneliness. For example, in contrast to familiar virtual assistants (e.g. Apple's Siri or Amazon's Alexa), the goal of assistive and social chatbots is to provide loneliness-beating open-ended, and engaging conversations (Blach 2020).

There is also a growing interest in using technology-assisted mindfulness or e-mindfulness (Stankov, Filimonau, Gretzel et al. 2020) as a coping strategy for existential loneliness. An e-mindfulness approach could motivate lonely individuals to interact with more people and build deeper connections (Lindsay et al. 2019; Simmons 2019; Stankov, Filimonau and Vujičić, 2020). Overall, technological capabilities provide the means for creating strategies and tactics for smart tourism to combat loneliness more efficiently and effectively. The following section conceptualizes and explores these capabilities in the context of designing smart tourism services for mitigating loneliness.

## 5 Designing smart tourism services for mitigating loneliness

The ultimate goal of integrating loneliness into smart tourism agendas in the post-pandemic era is to enable a loneliness-sensitive smart tourism ecosystem (LoSSTE) that will be able to identify (to detect) the sense of loneliness in consumers (before and during the tourism experience), and at the same time will be equipped to provide services for facing loneliness based on tailored consumer profiles (to act) in order to maintain consumer well-being during and after the tourism experience (to sustain) (Fig. 1).

### 5.1 Recognizing the complexity of loneliness and the need to contextualize it

Since the feeling of loneliness is present in different groups of consumers, ranging from narrow segments to general consumers who may be situationally or chronically lonely and experience a mix of social, emotional and/or existential loneliness, it is necessary to determine approaches and techniques to differentiate consumers based on their specific needs. Thus, designing loneliness-mitigating smart tourism services involves as a first step "*Recognizing the complexity of loneliness*". Better understanding consumers and their individual loneliness profiles serves to further tailor and

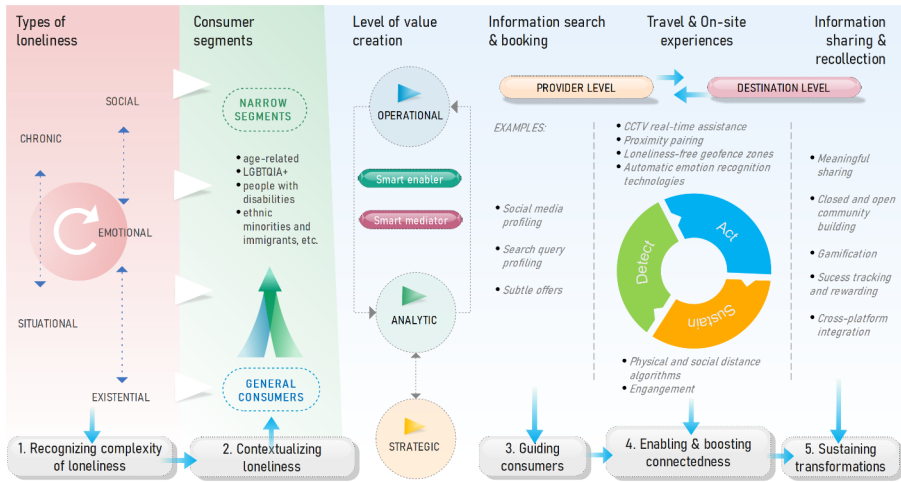


Fig. 1 Framework for designing a loneliness-sensitive smart tourism ecosystem (LoSSTE)

develop algorithms for application in smart tourism ecosystems. We call this step “Contextualizing loneliness”.

### 5.2 Value co-creation within the LoSSTE

Two principal roles of smart tourism technology within the envisioned LoSSTE can be proposed. First, technology can act as an enabler that directly faces the state of loneliness, as seen in the examples of companion robots, chatbots, or e-mindfulness applications. Second, technology can mediate social connections through matching algorithms and networking platforms. From the provider perspective, the integration of loneliness-mitigating technology should cover operational, analytic, and strategic levels of the business to optimize business outcomes and allow for long-term value creation.

The LoSSTE encourages interactions between value co-creation at the provider level and the destination level. While individual companies offer partial solutions for loneliness, i.e., solutions applied in a particular environment or intended for specific target groups, a smart tourism ecosystem can make this process ubiquitous; i.e., it can cover all phases of the tourist experience by including a large number of tourism service providers. For example, smart tourism could lean on the trend of companion robots used to help prevent loneliness in the elderly. The tourism industry has become one of the strongest promoters of the employment of robots for the automation of services and the enrichment of tourist experiences. Yet, barriers to adoption by tourism providers remain high (Ivanov et al. 2017). Robot-as-a-service (RaaS) options or motivating tourists to bring their own robots when traveling could help overcome some of the issues and make robot-enhanced tourist experiences more seamless. The preconditions for integrating consumer-owned robots in destinations and tourist facilities are increasingly discussed (Ivanov et al. 2019). However, at the smart business ecosystem or destination level, concerted efforts to integrate consumer-owned technologies, including those that combat loneliness, are currently missing.

Similar issues arise for consumer profiling, where it would be essential to consider the consumer context seamlessly across a tourism experience and beyond the trip. Smart tourism providers and destinations can be sensitized to create services that will initially recognize the need to provide additional assistance and to enable the frictionless transfer of consumer profiles to other service providers in the supply chain. For example, blockchain technology already provides the ability to track and transfer consumer profiles without compromising their privacy and without the need for permanent identification (Treiblmaier 2020). Cross-platform integration in the case of the LoSSTE could be of great importance since many tourists, including the lonely ones, could seek to control their own experience by using non-traditional tourism applications, for example, Tinder (Leurs and Hardy 2019).

### 5.3 Loneliness across the tourism experience phases

The enabling and mediating roles of technology apply to all travel phases, from pre-trip information search to during-trip information needs or after-trip information sharing. Across the tourism experience phases, the information search and booking phase is of particular interest since loneliness is a widespread phenomenon that can affect consumer preferences for services or brands and can shape online interactions. For instance, lonely people who use online travel communities for socialization are more likely to follow travel advice that is found there (Lee and Hyun 2015). Also, Qin (2017) pinpoints that loneliness modifies consumers' cognitive processing style and activates concrete thinking when evaluating social media messages. Constant streaming of beautiful travel photographs on social media by traveling friends could generate the feeling of loneliness in their home-based counterparts (Jovanović et al. 2019). Furthermore, the stigma associated with loneliness could become problematic (Griffin 2010). When searching for touristic information, even small cues (e.g., default 2-person search query options) could trigger negative associations with loneliness. Additionally, while many travel-advice portals promote solo travel to help overcome loneliness, this can also create awareness of one's loneliness.

Thus, already for the information search and booking phase, a more loneliness-sensitive approach should be applied by smart tourism providers/destinations. Although an explicit opt-in for loneliness mitigation offers could be applied, it would likely backfire if it triggers associations with stigma. Furthermore, the effects of platforms and information formats need to be considered. Due to the enhanced intimacy they offer, image-based platforms (e.g., Instagram) have a greater potential to ameliorate loneliness compared to just textual presentations of information (e.g. on Twitter) (Pitman and Reich 2016). Artificial intelligence (AI) that will drive the future of tourism information search is likely to change both marketing strategies and customer behaviours substantially (Davenport et al. 2020; Mich 2020), thus creating more loneliness-sensitive search and booking algorithms should be a priority. The strategic goal of smart tourism technology is to support consumers in creating enhanced experiences; consequently, the next step in the design process involves unobtrusively "*Guiding consumers*" towards loneliness-mitigating opportunities.

The main strategic goal during the travel and on-site experiences phase is to encourage relationship-building (Lim et al. 2019). We refer to this step in the design



process as “*Enabling & boosting connectedness*“. Underlying smart technologies to enable and boost connectedness already exist (e.g., proximity sensors for pairing consumers or enabling loneliness-free geofence zones or CCTV-based real-time assistance for spotting social isolation). However, this phase requires the most caution and should be carefully targeted at lonely people willing to engage. For example, social seating, while having created media hype, ultimately failed primarily due to privacy and security concerns and the danger of becoming a tool for digitally mediated hook-up encounters (James et al. 2019), and because free seat selection is favoured over social seating among general consumers (Koch and Tritscher 2017).

Automatic emotion (voice) recognition technologies seem promising for detecting loneliness (Lee et al. 2020). This could be of central interest for the on-site travel phase, as many hotel rooms are getting in-room voice-based AI digital assistants (Buhalis and Moldavska 2021). Employment of natural language processing (NLP) in quantifying sentiment and other aspects that point to loneliness in transcribed speech texts could extend this opportunity to all travel phases (Badal et al. 2020). Beyond careful profiling, loneliness-sensitive technology should also be highly context-adaptive to give priority to usability over loneliness-based services, especially when social discomfort is detected.

Many lonely travellers reach for their smartphones to compensate for the feeling of loneliness at the destination (Tan and Lu 2019), which only provides short-term relief. Sustaining positive change and acquiring well-being through transformational experiences (Pung et al. 2020) within the LoSSTE should be the strategic goal of the during and post-trip information sharing phase. Depending on the benefits sought by consumers (e.g., more social contacts, deeper relationships, or new habits), specific offerings can be provided within the LoSSTE. For instance, focusing information sharing during the trip on more meaningful conversations and personal reflections that resemble more in-depth communication among friends (Nima et al. 2017) constitutes one way of expanding well-being beyond the trip and can also help with creating emotional attachment in a time of crisis (Hang et al. 2020). This final step in the process involves “*Sustaining transformations*” and can be supported through techniques such as gamification. Cross-platform integration is also critical to potentially extend activities beyond the tourism experience.

## 6 Future research agenda

The main aim of this paper was to highlight loneliness in tourism as an issue that has been amplified during the COVID-19 pandemic and to set it as an essential subject for smart tourism service designers (Xiang et al. 2021) for the post-pandemic era. Beyond its practical implications for establishing a LoSSTE, it also provided the conceptual basis for understanding loneliness in tourism, as the issue of loneliness will not end when the pandemic is over. Based on the presented framework, four research directions emerge:

First, research should focus on the complexity of loneliness with a specific focus on emerging segments of loneliness-prone consumers or those unfamiliar with the newest loneliness-mitigating technologies. For example, some older individuals

would rather be isolated and lonely during the pandemic than learn new technologies because it would require them to adjust to the complex maze of technology (Tripathi and Bajpai 2021). A nuanced understanding of the impact of loneliness on tourism experiences for different consumers is currently lacking and should be tackled in future research. This goes hand-in-hand with the need to explore new ways of detecting loneliness, especially in dynamic smart tourism contexts. Second, a deep inspection of the capabilities and acceptability of smart tourism technology to detect, address, and face the problem of loneliness is proposed for further examination. This should not be seen as just another area of smart technology application (Molina-Collado et al. 2022) but as a chance to make it more human-centered (Fox et al. 2020; Gretzel and Stankov 2021), a tool that works for the real benefit of consumers and society and reduces the fear that forthcoming technology (for example, robots) (Io and Lee 2020; Leung and Wen 2021) will eventually replace traditional interpersonal connections (Liang and Lee 2017).

Third, the commercial viability, as well as the long-term impact of specific loneliness-mitigation efforts within a LoSSTE in terms of increased well-being, need to be carefully evaluated. Such research will also contribute to establishing performance indicators for smart tourism from operational to strategic levels that go beyond technology adoption and customer satisfaction measures to help build a better society through technology (Griffy-Brown et al. 2018).

Fourth, a recent review paper by Qirtas and colleagues (2022) on loneliness and social isolation detection using passive sensing techniques showed that almost 70% of studies do not address privacy or ethical issues. However, despite technological progress that permits the practical development of the envisioned LoSSTE, its main drawback is the protection and validation of privacy (Saravanan and Sadhu Ramakrishnan 2016) across various populations and within different kinds of tourism experiences. Smart tourism critically lacks legal frameworks that account for value co-creation across multiple providers, integration of consumer-owned technologies, and data exchange across providers and platforms. Future studies require a thorough investigation from both academic and practical perspectives.

Integrating a social issue like loneliness is a critical step towards creating more empathic, responsible, and transformational technology applications in tourism during the post-COVID recovery phase (Gretzel et al. 2020; Stankov and Filimonau 2021). It also helps steer smart tourism development agendas towards a greater well-being focus (Gretzel and Stankov 2021). Linking smart tourism research with more general discourses, for example smart aging (Song et al. 2018), is an important way of moving smart tourism research forward.

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s40558-022-00234-9>.

**Acknowledgements** This publication is based upon work from COST Action CA19136—International Interdisciplinary Network on Smart Healthy Age-friendly Environments and COST Action CA19142—Leading Platform for European Citizens, Industries, Academia and Policymakers in Media Accessibility supported by COST (European Cooperation in Science and Technology). The research was supported by The Science Fund of the Republic of Serbia, GRANT No. 7739076, Tourism Destination Competitiveness - Evaluation Model for Serbia -TOURCOMSERBIA.

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