Chapter 3.

The Perspective of Digital Ecosystems for Accessible Tourism: Conceptual and Operational Issues

Abstract

The digital ecosystems logic has the potential to enhance current understanding of accessible tourism, explaining how valuable tourism experiences for people with access requirements are co-created by multiple actors. The purpose of this chapter it to contribute to shed further light on this perspective and on its conceptual and practical implications. The chapter first presents the theoretical underpinnings of service ecosystems, moving then to digital ecosystems and to the role of digital platforms. These concepts are then applied to tourism experiences in general and to accessible tourism experiences in particular. Finally, reflections on the conditions for properly-functioning digital ecosystems for accessible tourism are presented.

3.1 Introduction to the logic of service ecosystems

The concept of service ecosystems is nowadays well established in service research, reflecting the awareness that value creation processes involve a system of multiple, co-evolving actors (Aarikka-Stenroos and Ritala, 2017). A recent literature review of academic studies on service ecosystems highlighted that the concept appeared for the first time in 2003 but gained popularity about one decade later (Gölgeci *et al.*, 2022), after Vargo, Lusch and Akaka had published their initial, well-known articles on this topic (Vargo and Akaka, 2012; Vargo and Lusch, 2011). Since then, the volume of academic articles on service ecosystems has quickly and steadily increased (Gölgeci *et al.*, 2022).

A service ecosystem is "a relatively self-contained, self-adjusting system of resource-integrating actors connected by shared institutional arrangements and mutual value creation" (Vargo and Lusch, 2016, p. 10-11). First of all, this conceptualization points out that, in service ecosystems, the focus in on the service logic meaning that service (exchange) is at the base of value co-creation in service ecosystems. Service means the application of an actor's knowledge and skills for the benefit of another actor. Value is then co-created through service-for-service exchanges among the actors (Lusch and Vargo, 2014a).

The current understanding of value co-creation in service ecosystems draws on the Service-Dominant Logic (S-D Logic) (Vargo and Lusch, 2004, 2008). One of the most important tenets of S-D logic is the distinction between operand and operant resources. Operand resources are those upon which an

act is performed, while operant resources –such as actors' knowledge and skills– are those that act upon operand and other operant resources (Vargo and Lusch, 2004). Technology itself is conceptualized as an operant resource by S-D Logic (Akaka *et al.*, 2019). Therefore, the ecosystems' actors act as integrators of resources and co-create value through their service exchange. In sum, all actors act as both providers and beneficiaries of service and, as a beneficiary, each of them phenomenologically determines value, that is the perceived "benefit, an increase in the well-being of a particular actor" (Lusch and Vargo, 2014b, p. 57). For a comprehensive and more detailed review on S-D Logic see Vargo *et al.* (2020) or Akaka *et al.* (2021).

In particular, in service ecosystems shared institutions are a particular type of operant resources which play a fundamental role to drive interactions and are needed for value co-creation. Institutions are intended as common norms and rules which act as (either formal or informal) coordinating mechanisms among the ecosystem's actors. Institutions "provide the building blocks for the increasingly complex and interrelated resource-integration activities in nested and overlapping ecosystems organized around shared purposes" (Akaka *et al.*, 2021, p. 382). More precisely, the definition of service ecosystems mentioned before refers to institutional arrangements, which are to be intended as "Assemblages of interrelated institutions, which can contain technological, sociological, cultural, and economic structures" (Akaka *et al.*, 2021, p. 381). Such institutional arrangements both influence and are influenced by value co-creation so that they are dynamically renegotiated and recombined (Akaka *et al.*, 2019). In fact, interactions among actors not only contribute to value co-creation but also to maintain and change institutions, leading to innovations in technology and markets (Vargo *et al.*, 2015).

Another fundamental contribution of the service ecosystems perspective lies in its ability to enable a deeper and more complex understanding of value co-creation by acknowledging the multiple interactions and influences taking place at multiple levels (beyond the recurrent focus on the customer-provider dyad). In detail, service ecosystems can be observed from different intertwined levels, known as "macro", "meso" and "micro". The macro level refers to the broader level such as nations; the meso level indicates structures such as markets, industries and brand communities, while the micro level focuses on individuals and dyads (Akaka *et al.*, 2021; Ciasullo *et al.*, 2020). Finally, service ecosystems continuously and dynamically evolve through their value co-creation activities with the aim of preserve their viability. In fact, as highlighted by the definition introduced at the beginning of this paragraph, service ecosystems are also "self-adjusting", meaning that each iteration of the value creation processes leads to a reconfiguration of the whole ecosystem (Vargo and Lusch, 2011).

3.2. The evolutions enabled by digital technologies and the digital ecosystems

Studies about service ecosystems have noted that the service logic is essential to understand the digital transformation of actors and markets (Ng and Vargo, 2018) and have conceptually pointed out the key role of technology as an operant resource (Akaka and Vargo, 2014). Drawing on these premises, some authors have investigated how digital technologies can facilitate resource integration and value co-creation among the actors (Balaji and Roy, 2017). Not surprisingly, this research stream is rapidly gaining popularity. In fact, Gölgeci et al.'s (2022) recent literature review of academic studies on service ecosystems found that one of the four main themes was related to technology as a change trigger in service ecosystems comprising aspects such as digitalization, internet of things, and business model innovation.

Starting from these premises, digital service ecosystems have been conceptualized as those service ecosystems supported by or created around a digital infrastructure. Such technology facilitates value co-creation in the ecosystem and enables also actors weakly tied to the ecosystems to participate the co-creation processes (Sklyar *et al.*, 2019). The digital infrastructure takes the form of a digital platform which facilitates actors' engagement to integrate their resources (Storbacka *et al.*, 2016). Hence a specific stream of research on business ecosystems has even specifically conceptualized platform ecosystems defined as those created around technological platforms, which is usually owned by a focal firm (Aarikka-Stenroos and Ritala, 2017; Peng *et al.*, 2023). More broadly, one or more actors (for example a focal firm) play a key role in driving the digital transformation of the ecosystem and providing the digital platform (Sklyar *et al.*, 2019; Storbacka *et al.*, 2016).

By facilitating and enhancing intra- and inter-organisational interactions among the actors, digital technologies have the potential to concretely improve value co-creation and actors' well-being in multiple ways. In detail, some of the most relevant evolutions supported by digital service ecosystems are the following:

- omnichannel service experience, which emerge from the co-creation of seamless customer journeys along multiple touchpoints and interactions with multiple actors (such as different service providers). In this context, the integration of real-time data from the ecosystems' actors supports the effective and efficient co-creation of seamless service experiences (Dalenogare *et al.*, 2022).
- data-driven decision making, which allows to improve the quality of the actors' decisions using insights from the continuous collection and analyzes of large amounts of data provided by different actors and at different points of the ecosystem (Cassia and Magno, 2022),
- automation, which draws on shared data and information to support chatbots, robots, and other forms of automation to increase customer experience (Ciasullo *et al.*, 2022).

- personalization of service experiences, which makes use of individual data and information about customers (and other ecosystems' actors) and techniques such as machine learning to design personalized service experiences within the ecosystem (Buhalis *et al.*, 2019; Kumar *et al.*, 2013).
- co-creation of new services, as highlighted by the stream of studies about digital servitization. According to this perspective, digital technologies not only can improve the co-creation of existing services but can also lead to the (co)development and configuration of new services (Struyf *et al.*, 2021).

In sum, digital platforms have the potential to enhance the value co-created by the ecosystem. At the same time, the introduction of new technologies such as platforms implies maintenance and change in the existing institutional arrangements among the co-creating actors (Akaka *et al.*, 2019). Therefore, the transition from a pre-digitalized to a digitalized service ecosystem is not necessarily smooth and successful due to factors such as the different levels of actors' digital maturity (Sklyar *et al.*, 2019). More broadly, the formation of new institutional arrangements in the digitalized service ecosystem requires shared intentions among the actors. In turn, such shared intentions are based on compatible sub-plans, mutual responsiveness, interdependence and knowledge of the conditions needed for the emergence of shared intentions from individual intentions (Taillard *et al.*, 2016). Therefore, digitalized service ecosystem not necessarily results in value creation but can also destroy value. For example, Schulz *et al.* (2021) reported the case of the introduction of an app to support service ecosystems for smart mobility which led to both value creation and value co-destruction because of insufficient resource integration among the actors.

3.3. The application of the service ecosystem logic to tourism experiences

The service ecosystem logic has gained increasing popularity in tourism studies, which is not surprising considering its ability to reflect the main characteristics of the tourism industries and of the co-creation of valuable tourism experiences; in fact:

- the (co)creation of tourism experiences requires extensive collaboration and interactions among a wide number of actors, including public and private ones and tourists themselves, thus involving an ecosystem of actors (Gretzel *et al.*, 2015).
- the actors participating to the (co)creation of tourism experiences belong simultaneously to multiple service ecosystems (Baccarani and Cassia, 2017). Broadly speaking "the tourism ecosystem consists of micro-experiences across online travel agencies, accommodation, transport and destination activities" (Buhalis *et al.*, 2019, p. 491). More in detail, the destination ecosystem –the most studied tourism ecosystem– overlaps with other ecosystems

(e.g., distribution channels) and has interactions outside the core geographical area (Gretzel *et al.*, 2015). Therefore, the identification of the actors contributing to the co-creation of specific tourism experiences is not immediately clear, which is reflected in the ecosystem's absence of clearly-defined boundaries.

- the number, types and characteristics of the actors participating to the co-creation of tourism experiences are continuously evolving, making tourism ecosystems dynamic and adjusting to the changing scenario. In particular technological advancements have enabled both new actors (for example, online intermediaries) and of a wider array of already existing actors to participate to the co-creation processes. The prominent role of technology is reflected in the concept of smart tourism ecosystem which indicates the "tourism system that takes advantage of smart technology in creating, managing and delivering intelligent touristic services/experiences and is characterized by intensive information sharing and value co-creation" (Gretzel *et al.*, 2015, p. 560).
- co-creating valuable experiences for tourists (or the achievement of the so-called tourist experience quality) is highly complex. Unsatisfactory resource integration in one of the ecosystems participating to experience co-creation (e.g., the transportation ecosystem) (Baccarani and Cassia, 2017) as well as inconsistencies across actors in delivered quality and in the information provided to tourists (Bigi *et al.*, 2022) may compromise the overall value or wellbeing experienced by tourists.

Available tourism literature adopting the service ecosystems logic has investigated co-creation at the macro-, meso- and micro-levels (Simeoni and Cassia, 2019). However, the vast majority of extant literature has taken the meso-perspective of destinations considering Destination Management Organizations (DMOs) as the focal actors aiming at coordinating and optimizing the offerings of a destination's multiple service providers (for a comprehensive review see Gao *et al.* (2022)). This stream of studies has particularly emphasized the role of digital ecosystems proposing the concept of smart destinations (Sorokina *et al.*, 2022). Such ecosystems require the use of digital platforms to foster collaboration among the actors and involve tourists in experiences co-creation. In detail, several digital platforms have been proposed for this purpose:

- websites and portals, including those promoted by DMOs or by other actors of the destination. These platforms take the form of Destination Management Systems, which combine the front-end websites or portal to be used by tourists, with intranets and extranets to facilitate collaboration and coordination among the destination's stakeholders involved in service provision (Estêvão *et al.*, 2022). For example, the DMO of San Francisco uses its website to collect information from tourists, integrate it with information from other actors and co-

creating personalized itineraries using a recommender systems (Femenia-Serra *et al.*, 2019). Another example is provided by Cabiddu *et al.* (2013) who studied the website promoted by an inbound tour operator, Portale Sardegna (Sardinia, Italy), which established an Internet-enabled network of affiliated hotels with the intent of promoting a new value proposition, that is Open Voucher.

- mobile apps: for example, Barile *et al.* (2017) analyzed the case of a tourism app, Smartour, created in the city of Salerno (Italy) to bring together the services offered by actors in the destination. The app proposed tourist routes in the city, providing integrated information about the timetable of transport services, the total costs of the attractions etc., included in the routes. In addition, the routes suggested to tourists were personalized based on their preferences collected (if authorized) from tourists' profiles on social media through tourists' involvement in gamified activities.
- social media: Ge and Gretzel (2018) investigated co-creating actors and activities on Weibo, finding that several destinations actors such as DMOs, museums and other tourism attractions, accommodation providers and local administrations as well as tourists contributed to tourism experiences co-creation and sharing. Similar studies were conducted on other social media platforms, such as Facebook, Instagram and Twitter (Buhalis and Foerste, 2015).

To accomplish their aims, digital platforms can combine several functionalities, including those facilitating travel planning and bookings (of flights, tickets for attractions, accommodations, etc.), chatrooms, chatbots, forums, blogs, interactive maps and location-based services, link to third party platforms (such as TripAdvisor), sharing of itineraries planned by other tourists, personalized and real-time information about the availability of services and many others. When properly designed, these functionalities, satisfy tourists' informational, communicational, transactional, relational needs (Estêvão *et al.*, 2022).

Recent studies are further reflecting on the future role of artificial intelligence in shaping co-creation within destination service ecosystems. Artificial intelligence could impact access to relevant information (for example, DMO-provided robots could guide tourists through the destination), personalization of the experience (artificial intelligence could create offers and autonomously book the related services based on tourist's preferences), integration of physical and virtual experiences of a destination (Grundner and Neuhofer, 2021).

The availability of an engagement platform is fundamental but not sufficient to enable a destination's actors to co-create valuable tourism experiences. Drawing on the service ecosystems view and lexicon, shared intention is a prerequisite for the formation of new institutional arrangements such as those related to the adoption of a new platform for resource integration and value co-creation (Taillard

et al., 2016). Moreover, tourism literature acknowledges that some conditions have to be satisfied for successful platform-based value co-creation, such the actors' willingness to cooperate and share information, the availability of adequate resources including time for daily operations (e.g., daily updates of information in the platform), the DMO's ability to coordinate the system (Estêvão *et al.*, 2022). Regarding the last condition, that is ecosystem coordination, ongoing debate suggests that both private and public sector organizations should play a role in setting up coordination mechanisms to develop and sustain effective coopetitive relationships. In particular, "in tourism destination service ecosystems, the creation of artifacts (formal documents informing the common vision and guiding principles) developed by a public sector organization facilitate collective decision-making and overcome competitive tensions within private organizations" (Picaud-Bello *et al.*, 2022, p. 453). In addition, regarding the use itself of these technological platforms, issues related to data policies (including privacy and security), technological culture and capabilities as well as ethical issues need to be addressed by the involved actors for the proper functioning of the ecosystem (Sigala, 2018).

In sum, the service ecosystem logic proved valuable to understand the co-creation of tourism experiences at the destination (or meso) level, and specifically of the co-creation supported by digital platforms. However, in addition to the limitations discussed before (e.g., limits in the availability of technological skills), additional matters of concern should be emphasized. Tourism experiences emerge from the co-creation processes involving multiple actors, who are simultaneously part of different ecosystems, with the tourist as the beneficiary of the co-created value or wellbeing. However, co-creating actors are often unaware of being part of the same ecosystem and have only a partial view of all the interconnected service ecosystems that a tourist is involved in during a travel (Baccarani and Cassia, 2017). Moreover, the ecosystems which are relevant for the co-creation of a specific tourism experience extend beyond the boundaries of the destination, such as the case of the transportation ecosystem which makes it possible for the tourist to reach the destination.

The identification of the relevant ecosystems and of their actors requires then to follow the Tourism Customer Journey (TCJ) perspective, which involves tracing the complete path of a tourist, including all the phases and interactions a person goes through when traveling for tourism purposes (Åstrøm, 2020). The TCJ comprises four main stages –destination choice and trip design, outbound trip, staying at the destination, transfer to another destination or return home– which can be articulated in dozens of activities and interactions, involving dozens of actors, from transport and accommodation providers to municipalities and destinations' residents (Cassia *et al.*, 2021). Moreover, also companies usually assigned to other industries (such as medical services providers and retailers) (Gretzel *et al.*, 2015). In sum, the application of the service ecosystems logic to tourism highlight

enables a comprehensive understanding of the complexity of the processes behind the co-creation of valuable tourism experiences.

4. Digital ecosystems and accessible tourism

By definition accessible tourism requires collaboration among multiple actors (Shahzalal and Elgammal, 2022). In fact, accessible tourism is a "form of tourism that involves collaborative processes between stakeholders that enables people with access requirements, including mobility, vision, hearing and cognitive dimensions of access, to function independently and with equity and dignity through the delivery of universally designed tourism products, services and environments" (Buhalis and Darcy, 2011, p. 10). In other words, the co-creation of valuable tourism experiences with people with access requirements emerges from resource integration among cooperating actors in service ecosystems. During each stage of the customer journey of tourists with access requirements, various actors play a role in shaping the overall tourist experience by either delivering or not delivering on expectations. These actors form the tourism service ecosystem (or a combination of ecosystems) from the tourist's perspective and have to work together to co-create value for the customer. However, there is often a lack of coordination among the actors involved in co-creating the tourism experiences and sometimes even a lack of awareness of belonging to the same ecosystem. In fact, each actor often tends to perceive only a portion of the tourist customer journey and fails to gain a comprehensive understanding on the formation of customer experiences.

Recent work has identified multiple barriers which hinder the effective co-creation of tourism experiences for tourists with disabilities, thus limiting the formation of tourist's wellbeing. Such barriers can be classified into the following types (Cassia *et al.*, 2021):

- Informational barriers: they refer to the difficulties faced by individuals with disabilities when trying to independently evaluate and choose transportation, accommodations, holiday itineraries, or other activities. Despite the abundance of general information available for these services, the specific informational needs of people with disabilities result in higher levels of complexity. For instance, even when information about tourism services is accessible, it can still be challenging to verify its accuracy and suitability for their needs (Singh *et al.*, 2021).
- Architectural barriers: they refer to the multiple challenges faced by individuals with disabilities while on holiday, such as accessing transportation, navigating different locations, and using sidewalks (Agovino *et al.*, 2017).

- Political barriers: they refer to the fact that, despite political discourse promoting the elimination of architectural barriers, political actions are in many cases driven by immediate priorities and short-term thinking (Magno and Cassia, 2015).
- Cultural barriers: they refer to the lack of understanding and respect people show towards individuals with disabilities and are reflected by behaviours such as the improper use of parking spots for people with disabilities. These barriers also include tourism and hospitality personnel's lack of proper education about the needs of people with disabilities (Tlili *et al.*, 2021).
- Relational barriers: they refer to the difficulties in establishing relationships with people with disabilities because biased views and stereotypes. For example, tourism service providers hold stereotypical beliefs that all individuals with disabilities have similar characteristics and needs (Shahzalal and Elgammal, 2022).
- Technological barriers: they refer to the rapid and continuous changes in communication technologies, often increasing the digital divide for people with disabilities (Tlili *et al.*, 2021).
- Entrepreneurial myopia barriers: they reflect tourism and hospitality entrepreneurs' inability to perceive the remarkable size and value of the tourism market for people with disabilities (Darcy *et al.*, 2010).

Technology can contribute to solve –at least partially– the mentioned barriers. A detailed literature review by Teixeira *et al.* (2021) indicated the usefulness of several technologies for this purpose. Some of them are already in their maturity phase such as websites while some others are in their growth stage such as mobile apps. In addition, there are many technologies in their embryonic stage such virtual reality, image recognition software, cloud technologies and online multimedia material (Teixeira *et al.*, 2021). More precisely, from the ecosystem perspective, the focus is on understanding how digital platforms can contribute to overcome the barriers reviewed before and to increase coordination among the actors to co-create high-quality experiences for tourists with disabilities (Accordino *et al.*, 2022; Tlili *et al.*, 2021). For example, the website of ENAT, the European Network for Accessible Tourism, on its portal (https://www.accessibletourism.org/?i=enat.en.projects), supported by the European Commission, carries a number of ongoing and past (since 2009) projects and good practices based on technological platforms to support the emergence of ecosystems for accessible tourism. Moreover, new platform-based ecosystems for accessible tourism are being promoted by firms and startups such as the case of Willeasy, which defines itself as the "he first digital accessibility ecosystem that creates connections between people with special needs and the right facilities to best accommodate them" (https://www.willeasy.net/project/en/home-english/). In

particular, Willeasy collects data on the accessibility of places, events and facilities making them available to people with specific needs with the support of artificial intelligence.

Despite a growing number of initiatives to facilitate the emergence of digital ecosystems for accessible tourism, extant research suggests that much still remains to be done. For example, the analysis of the city of Porto (Portugal) revealed that it is overall an accessible destination but it also showed that accessibility was not properly conveyed on technological platforms. Even the official destination's and attractions' websites did not comply with the minimum standard of accessibility (that is, information about accessibility was not accessbile). Moreover, even the website Accessible Itineraries contained only generic and not updated contents (Casais and Castro, 2021). Therefore, as outlined by the literature on digital ecosystems, it should be remarked that technological platforms cannot by themselves guarantee effective value co-creation and that their adoption can sometimes even result in value co-destruction.

Shared awareness and intentions among the involved actors is fundamental for properly-functioning digital ecosystems and all the co-creating actors have to be equipped with the needed resources (knowledge and skills) to participate in successful resource integration. For these reasons, educational activities about how individual with disabilities experience tourism is a necessary condition for co-creation. For example, the ongoing project Feelit (https://feelit.infoproject.eu/), focusing on tourism for deaf and hard of hearing people, aims also to create a virtual-reality and personal-computer 3D game for tourist providers to understand how it feels to be a visitor with hearing impairments in a foreign country. Similarly, also tourists should be equipped with the needed knowledge and skills (that is, with the necessary operant resources) to take part to experience co-creation, starting from knowledge and skills to access and use engaging platforms (being them websites, apps or other platforms).

In addition, the emergence of digital ecosystems for accessible tourism requires time and efforts because it implies a "non-linear process in which all actors engage in institutional work and co-create institutions through multiple iterations of institutional developments until common templates emerge that reflect shared conceptions of problems and solutions" (Vargo *et al.*, 2015, p. 69). The overview of past projects (such as those described on the ENAT portal) to facilitate the emergence of digital ecosystems seems to indicate that shared intention and coordination mechanisms are essential to ensure that the ecosystem becomes self-adjusting and continues to "exist" and co-create value over time. For this purpose, some authors have proposed that the digital ecosystems for accessible tourism should be led by public authorities in charge at the territorial level, being it a city, a region, or a country (Cassia *et al.*, 2021). On this point, Shahzalal and Elgammal (2022) argued that actors' collaboration led by government agencies with regulatory powers together with some key

stakeholders can result in higher actors' engagement in the ecosystem's activities toward sustainable tourism. More explicitly other studies (e.g., Estêvão *et al.*, 2022) have proposed that DMOs (whenever they have been established) at national, regional, and even local DMOs should act as leaders of such initiatives through destination marketing systems. However, more empirical research is urgent to better understand the conditions required for well-functioning digital ecosystems for accessible tourism to emerge and to develop over time.

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