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RESEARCH ARTICLE



Service design for the destination tourism service ecosystem: a review and extension

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ABSTRACT

This paper aims to synthesize two emerging streams of literature in tourism, i.e. service design and destination ecosystem, and develops a conceptual framework for service design for the destination tourism service ecosystem (DTSE). Three core themes revealed from the literature review include service concept, service ecosystem and service process. Based on the thematic findings, we built a two-level nested framework of a DTSE and developed an integrated model for the service design. A case study of Tangbu Village in China was used to expound the practical application of the model. Finally, we propose an agenda for future research.

KEYWORDS

Service design; destination tourism; tourism service ecosystem; service concept; value co-creation; customer journey mapping

Introduction

Tourism is a service-intensive industry (Avlonitis & Hsuan, 2017), and its fundamental product is tourist experience at the destination. A tourism destination can be epitomized as a geographically defined area with a uniform identity offering various tourism products (Binter et al., 2016; Buhalis, 2000). The tourism service of a destination involves the participation of multiple stakeholders (Hillebrand et al., 2015). It can be conceptualized as a service ecosystem that consists of various actors who exchange resources and interact to co-create value (Van Riel et al., 2019). The ecosystem is a term borrowed from ecology, referring to the biological ecosystem (Moore, 1993). The prefix “eco” refers to the nature of interdependency and co-evolution among actors or entities within the ecosystem. The term “system” refers to a specific set of entities that are interdependent but independent from those in other systems, forming the boundaries between ecosystems. A destination tourism service ecosystem (DTSE) can be viewed as a set of interdependent entities based on the geographical scope

of the destination, which can be local, regional, national. Furthermore, from a systems science perspective, the tourism destination itself can be broadly considered as a social-ecological system (Levin et al., 2013), within which numerous actors, such as tourism customers, service providers, other economic stakeholders, and regulatory bodies interact with each other (Polese et al., 2018), and many of them are often direct competitors. In an increasingly dynamic, interconnected, and competitive environment, even the direct competitors may need to collaborate to offer seamless service to customers and to enhance the competitiveness of the destination service ecosystem as a whole entity (Chim-Miki et al., 2020; Czakon & Czernek-Marszałek, 2020; Della Corte & Aria, 2016). Therefore, how to efficiently and dynamically integrate resources and form an interactive network of collaboration is an essential task and challenge for destination management managers (Baccarani & Cassia, 2017; Vargo & Lusch, 2011).

Service design, a contemporary method for systematically designing customer experience, has

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gained increasing attention in the tourism industry in the past few years (Zomerdijs & Voss, 2010). Service design is defined as a structured service development process that is shaped in accordance with the needs and expectations of the customer (Karadayi-Usta & SerdarAsan, 2020). In recent tourism studies (Hlee et al., 2019; Liang, 2017; Lin et al., 2020), service design has been used to explore the improvement of the tourism service system. Patrician et al. (2011) advance a new interdisciplinary method of multilevel service design to integrate the design of service offering at the following three hierarchical levels: service concept, service system and service experience blueprint, which provides an effective way to deal with the increasingly complex service system. It is committed to matching the service delivery capacity and capabilities with customer demand (Karadayi-Usta & SerdarAsan, 2020), and delivering an excellent tourism experience (Tomej & Xiang, 2020; Tussyadiah, 2014). Applying the collective thinking and methods of service design to tourism can help the destination to deploy its finite resources (Avlonitis & Hsuan, 2017; Tussyadiah, 2014) and provide a well-coordinated and holistic tourism experience for visitors (Peng & Lin, 2016).

Few studies, however, have explored an all-inclusive framework of service design of a DTSE. The existing research on destination tourism service system focuses on the relationship between the allocation of service supply and destination brand and image (Binter et al., 2016; Chi et al., 2020), tourism service quality (Chin & Lo, 2017; Park et al., 2011), tourist satisfaction (Jensen et al., 2017; Teshome & Demissie, 2018) and tourist loyalty (Akroush et al., 2016) from the perspective of tourism marketing and management. The framework of tourism service system is often proposed on the supply chain composition (Chen, 2014) or supply-demand structure (Chin & Lo, 2017), both characterized by B2C interaction. Another research flow emphasizing “ecosystem” is often bound with the dimension of technology, discussing how the technologies (especially ICTs) are used to achieve the value co-creation among tourism service actors, so as to put forward the concept of smart service ecosystem (Buhalis, 2019; Polese et al., 2018; Troisi et al., 2019). Unlike previous works, the paper aims to highlight the special attribute of destination as a “social ecosystem”, and develop a conceptual framework of service design based on a DTSE by integrating the dynamic thought of social ecosystem and the collective

thinking of service design. The goal is to enable all system actors to generate agile solutions and value in the process of participating in the development of destination tourism services, which involve value co-creation in all dimensions (including B2C, B2B and C2C). By engaging different actors simultaneously to optimize the collective performance and competitiveness, we also aim to provide an overall solution for the development of destination tourism services for DMOs to achieve tourism sustainability (Buhalis, 2019).

For this purpose, we carried out a literature review in the overlapping fields of service design and tourism, and advanced the thematic exploration with the three-level structure proposed by Patrician et al. (2011) as the initial framework. Based on it, we developed the research propositions, construct a conceptual framework by logical deduction and further propose an agenda for future research.

Methodology

We followed the approach suggested by Carter and Rogers (2008). Firstly, we evaluate a number of collected works to summarize the common elements and the differences. Secondly, we combine a selected theory (e.g. Service Design) to develop the research propositions, and finally, we construct a conceptual framework by logical deduction.

For the review of relevant literature, we adopted the content analysis-based approach (Seuring & Gold, 2012), which involves a) material collection, b) a descriptive analysis, c) category selection, and d) material evaluation. We conducted category selection by following the coding logic of content analysis techniques. We established a theory-based categorization scheme through deductive and inductive categories to ensure the validity of the literature review (Sauer & Seuring, 2017; Seuring & Gold, 2012).

Material collection

The overall data collection and literature selection process is shown in Figure 1, which consists of four steps (Rowley & Slack, 2004). The first step involved using the Scopus database to search for all possible combinations of service design-related and tourism-related keywords. These keywords were determined through brainstorming among the co-authors, which include three senior academics specializing in tourism management and consultation with three

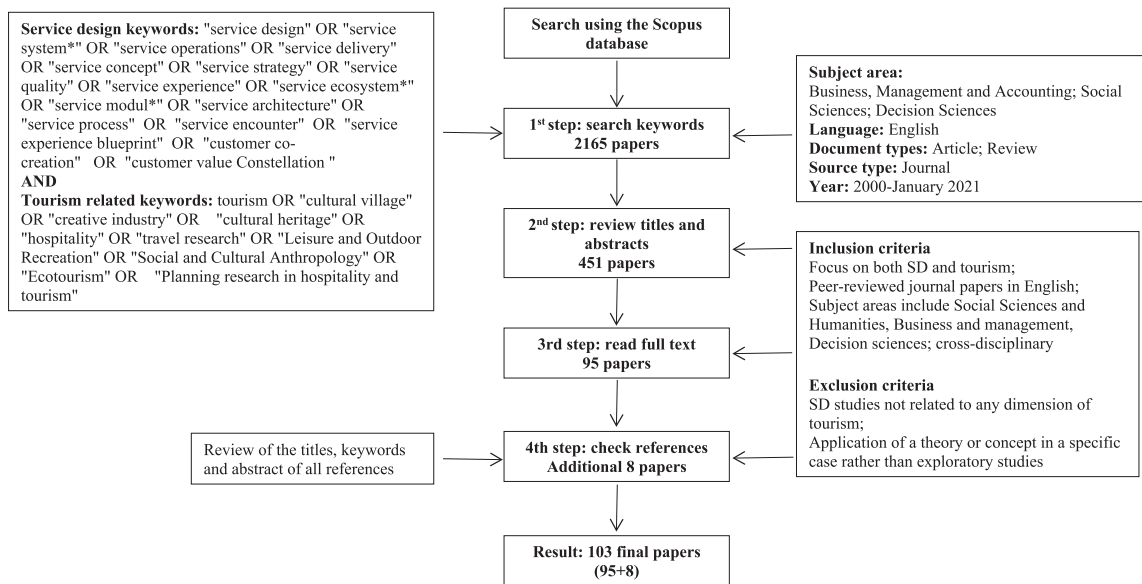


Figure 1. Literature review process.

external academic experts who are also tourism management or service design academics. The search was conducted in January 2021. In total, 2165 papers were identified through the search.

In the second step, the title and abstract were evaluated according to the criteria listed in Figure 1. This round of screening produced 451 potentially relevant papers. In the third step, we read the full texts of those articles, and identified 95 articles with the highest relevance. Finally, by checking the references, we further identified additional eight articles that are relevant. Ultimately, we included 103 articles for the final review.

Descriptive analysis

The 103 articles were distributed in 48 journals. Of these articles, more than two-thirds were concentrated in 19 journals in the field of tourism. The top two journals are Tourism Management (14 papers), the International Journal of Contemporary Hospital Management (7 papers), and the Current Issues in Tourism (5 papers). There were 7 journals with 3 articles as shown in Table 1.

The time period of the publications was from 2000 to 2020 (Table 1). The first related article appeared in 2000, but it was not until 2009 that the number of papers concerning the subject has begun to increase gradually. Particularly in the recent three years, publications have grown significantly. In terms of the

distribution of the research methods (Table 1), 31 papers use qualitative methods (e.g. case study,) and 41 papers use quantitative research methods (e.g. survey), and a few articles belong to the category of conceptual development and content analysis.

Thematic findings

Patrician et al. (2011) integrate the design of service offering at the following three hierarchical levels: service concept, service system and service experience blueprint. An internal logic behind the three-level framework is to answer three questions in a progressive way, i.e. what to provide – which resources to be involved – and how to allocate these resources. Based on this logical framework, we analyzed the extant literature. First, we extracted related theoretical concepts regarding the three levels of Patrician et al. (2011) to identify second-order themes. In the light of the second-order themes, we reviewed and coded relevant research findings from the original literature, to further formulate the first-order concepts (Yin, 2014). By analysis and induction in the first-order stage, cognition from different perspectives is constantly supplemented, which allows us to reveal new relationships to improve and perfect the proposed concepts in the second-order themes (Duriau et al., 2007; Jia et al., 2020). Finally, we moved to the aggregate stage and developed a more universal

Table 1. Distribution of the articles reviewed.

Journals/articles distribution	No. of papers	Year	No. of papers	Methodology	No. of papers
Tourism Management	14	2000–2002	1	Survey	41
International Journal of Contemporary Hospitality Management	7	2003–2005	0	Case study	31
Current Issues in Tourism	5	2006–2008	1	Content analysis	14
Journal of Service Research	3	2009–2011	8	Conceptualization	13
Journal of Travel Research	3	2012–2014	12	Literature review	4
Journal of Vacation Marketing	3	2015–2017	24	–	–
Tourism Analysis	3	2018–2020	57	–	–
Tourism Economics	3	–	–	–	–
TQM Journal	3	–	–	–	–
Annals of Tourism Research	3	Total	103	Total	103

theoretical framework by integrating these new relationships and constructs (see [Figure 2](#)). The whole thematic coding process is a cyclical and iterative progression of logical reasoning ([Hartley, 2004](#); [Yin, 2014](#)).

In order to clearly present the hierarchical progressive structure of the three-level framework, we stated the coding results in reverse, that is, first propose the aggregate dimensions (see 3.1, 3.2, 3.3), then outline the composition of thematic findings under each dimension (second-order construct, see sub-headings of 3.1, 3.2 3.3), and finally discuss the conceptual content in detail (first-order definitions). The aggregate dimensions of the three-level framework for tourism destinations can be defined as: a) service concept, b) service ecosystem; and c) service process.

Service concept

As the core of service design, service concept defines the benefits provided by the service to the customer ([Patrician et al., 2011](#)). Tourism is considered the largest experience producer ([Binkhorst & Dekker, 2009](#)), and the personal experience of tourism customers determines the success or failure of destination tourism products ([Yuan & Wu, 2008](#)). An experience-centered service concept of destination tourism is needed and generally includes the following two levels: a) tourism destination brands, and b) value propositions. The former represents the strategic positioning of a destination ([Kankhuni, 2020](#)), and the latter attaches meaning to tourism experiences ([Tussyadiah, 2014](#)).

Destination brand

The destination brand represents a distinctive place identity ([Akroush et al., 2016](#); [Rather et al., 2019](#)),

which has been used to differentiate the experiences that tourists can expect in a destination ([Chi et al., 2020](#); [Giannopoulos et al., 2020](#)). Some case studies have pointed out that the effective destination brand positioning must be in line with local characteristics, believable, simple and appealing ([Bassano et al., 2019](#)). For example, forest-based well-being is considered as the tourism destination brand in eastern Finland ([Konu, 2015](#)), and “a taste of place” is on the island of Grenada ([Thomas-Francois et al., 2017](#)).

Value propositions

As typical experience-centric services, tourism attracts customers from physical, emotional, behavioral, intellectual and even spiritual aspects ([Adhikari & Bhattacharya, 2016](#); [Komula & Lassila, 2015](#); [Rezaei et al., 2017](#)). Several studies have shown that there are multiple dimensions of tourism experience or value propositions, including functional, cognitive, emotional and social dimensions ([Campos et al., 2018](#); [Lei et al., 2019](#); [Zhang et al., 2019](#)). Correspondingly, these value dimensions are closely related to physical properties ([Akroush et al., 2016](#)), knowledge ([Tosun et al., 2015](#)), affection ([Tosun et al., 2015](#)), and relationships ([Chiu et al., 2017](#)).

For the development of value propositions, [Bassano et al. \(2019\)](#) suggest the use of “place storytelling”, to present the tourism destination in a narrative way, sharing anecdotes, experiences, and stories of destinations among all stakeholders. In addition, [Lin and Fu \(2017\)](#) propose that before the tourism experience begins, the value associated with “imaginative” and “an exciting life” in tourism products should be emphasized, and after a tourism experience, the feelings of “happiness” and “freedom” shaped by tourism should be emphasized, to fulfill tourists’ desire for “inner harmony”.

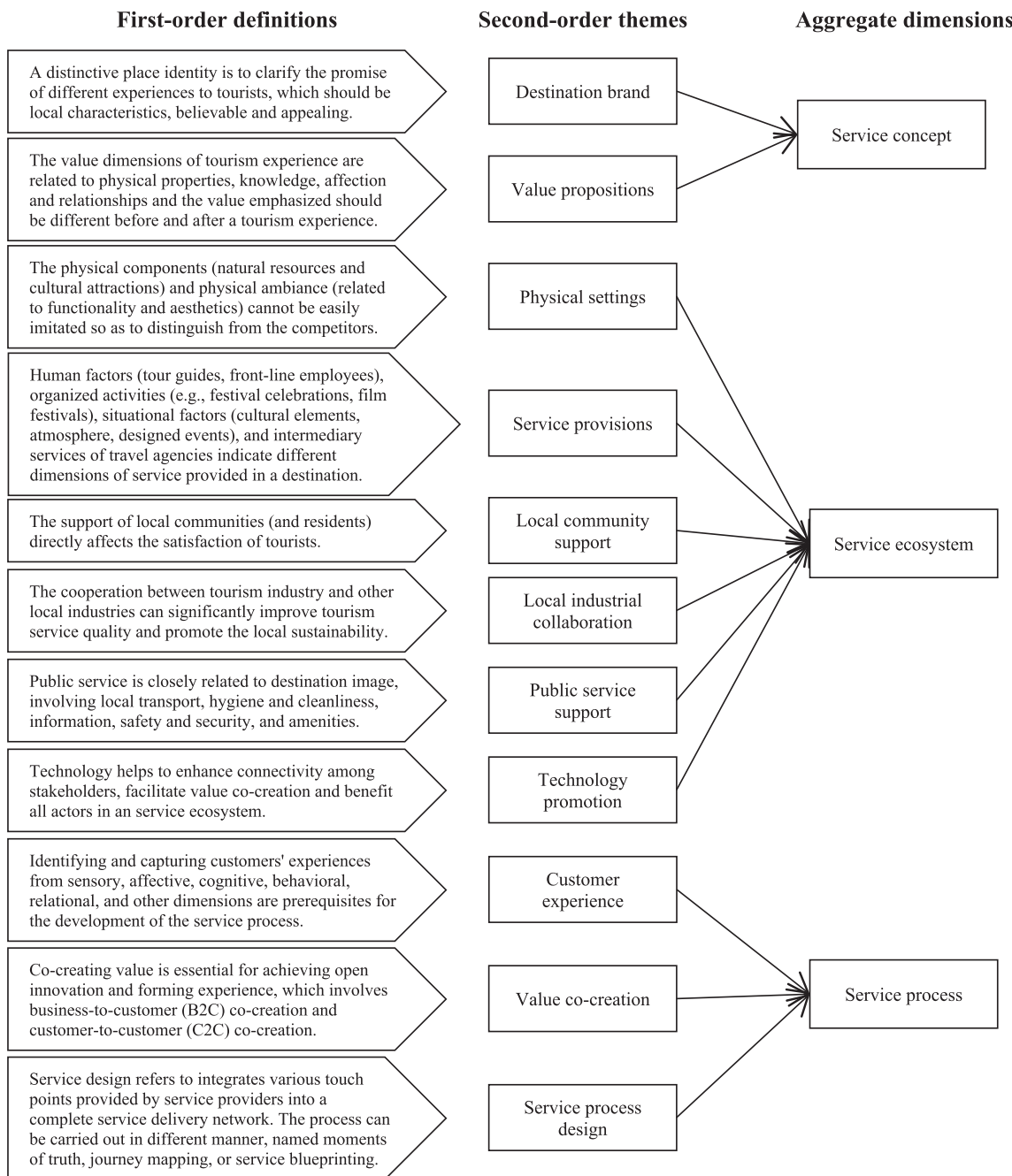


Figure 2. Coding structure.

Destination tourism service ecosystem

There is little research on DTSE in the extant tourism literature. The service ecosystem of a tourism destination is seen as a service network for value co-creation (Bassano et al., 2019) that involves various

stakeholders and resources (Baccarani & Cassia, 2017; Troisi et al., 2019; Van Riel et al., 2019). The relevant themes that emerged from our review include physical settings, service provisions, local community support, local industrial collaboration, public service support, and technology promotion.

Physical settings

The physical setting can be summarized as a collection of elements of physical components and physical ambiance (Zomerdijsk & Voss, 2010), both of which are considered important hardware environments in destination research. The physical components of a destination include natural resources and cultural attractions (Chin & Lo, 2017), such as scenery, vegetation, wildlife, historic architectures, and monuments (Chen et al., 2009). As the physical components cannot be easily imitated or copied, thus distinguishing the destination from the competitors (Dedeoğlu et al., 2020). Physical ambiance involves design factors related to functionality and aesthetics (e.g. temperature, music, lighting, visual presentation) (Zhou et al., 2019; Gupta et al., 2012). From an environmental psychology perspective, the physical ambiance can evoke cognitive, emotional and physiological responses in tourists through the sensory design (including sight, sound, smell, taste and touch) (Zomerdijsk & Voss, 2010). Positive sensory design can create a relaxing and pleasant atmosphere or a “sense of place” to enhance tourist experiences (Jensen et al., 2017; Rihova et al., 2015).

Service provisions

The service activities and elements directly connected to customer experiences in the process of tourism are discussed in related articles, which can be summarized into the following four dimensions: human factors, organized activities, situational factors, and intermediary services (Chen, 2014; Jensen et al., 2017; Komppula et al., 2016; Tussyadiah, 2014).

Human factors. Tour guides and front-line employees are viewed as performers and mediators of tourism service in much research (Alazaizeh et al., 2019; Dong & Siu, 2013; Hwang & Han, 2014). Although tour guides could be partly replaced by new mobile technologies (Pedrana, 2014), they still play a key role in promoting customer participation and co-creation of experience (Komppula et al., 2016). Front-line employees are required to engage with customers in experience-centric tourism (Zomerdijsk & Voss, 2010). Allowing front-line employees to participate in the innovation process can motivate them to develop ideas and knowledge from service contacts (Sørensen & Jensen, 2015).

Organized activities. Organized activities provide numerous opportunities for interactions and socializing (MacKinnon, 2017) to create multi-sensory experiences (Zátori, 2016) and unforgettable travel memories (Hwang & Han, 2014). The existing case studies have examined various organized activities, such as celebration festivals (Dai et al., 2017), film festivals (Park et al., 2011), musical performances (MacKinnon, 2017), entertainment programs (Hwang & Han, 2014), sports programs (Yeh et al., 2016), outdoor recreation (Winter et al., 2020), leisure activities (Prebensen et al., 2013), creative activities (Tan et al., 2013), temple fairs and village markets (Rihova et al., 2018), theme activities (Komppula et al., 2016). They are usually closely related to immersive (MacKinnon, 2017), authentic and customized experiences (Tan et al., 2013).

Situational factors. Situational factors can be designed to evoke the values and meanings of the tourism experience (Tussyadiah, 2014), enhancing engagement and emotional connections (Zomerdijsk & Voss, 2010). However, only a few studies have discussed situational elements, which are mainly referred to cultural elements (e.g. symbols and souvenirs), cultural atmospherics (e.g. art scenes) and designed events (Bassano et al., 2019; Zátori, 2016; Zomerdijsk & Voss, 2010). Designing and managing the sequence of events as in dramas or movies are important for the creation of emotional effects (Zomerdijsk & Voss, 2010). And the creation of a place story could serve as an excellent tool for interpreting events and enhancing brand competitiveness (Bassano et al., 2019).

Intermediary services. Travel agencies serve as the intermediaries between supply and demand in destination tourism (Avlonitis & Hsuan, 2017). Different from DMOs, travel agencies are mainly responsible for the assembly and distribution of destination tourism products (Chen, 2014). Recent studies suggested that new information and communication technologies have brought new challenges for tourism intermediary services organizations (Avlonitis & Hsuan, 2017). There have been challenges of a “re-intermediation process”, in which increased co-creation activities are encouraged (Grissemann & Stokburger-Sauer, 2012).

Local community support

Local community support and the friendliness of local people are generally regarded as an essential dimension in tourism experience quality (Ghasemi, 2019). Interaction with locals creates a deep tourism experience, which is an opportunity for destinations to stage and strengthen the social aspects of terroir (Prayag et al., 2020). Studies primarily focus on rural tourism (Chin & Lo, 2017; Choi et al., 2018; Dai et al., 2017) and form a consistent point of view that the support of local communities (and residents) directly affects the satisfaction of tourists (Choi et al., 2018; Ghasemi, 2019) and the success of rural tourism (Chin & Lo, 2017).

Local industrial collaboration

The cooperation between the tourism industry and other local industries, as well as the integration of local industries into the tourism supply chain, can significantly improve tourism service quality and promote the economic and social sustainability of a destination (Zhu et al., 2022; Mi et al., 2019). However, only a few articles discuss collaboration between local related industries and tourism, which mainly involves artifacts manufacturing (Peng & Lin, 2016; Rihova et al., 2018), traditional souvenirs (Ardani et al., 2020), and agriculture, especially local foods (Liang, 2017; Thomas-Francois et al., 2017; Thomas-Francois et al., 2018). Innovation of local foods can be sought in local specialties or farm products (Lin et al., 2020), and integrating local food into the tourism supply chain enhances tourist experience while contributing to the local economy and society (Thomas-Francois et al., 2018).

Public service support

Public service plays an important role in influencing destination service quality (Tosun et al., 2015; Wu et al., 2017) and destination image (Akroush et al., 2016; Mi et al., 2019; Teshome & Demissie, 2018). The public service support for destination tourism emerged from our review can be organized in the following five aspects: a) local transport services, b) hygiene and cleanliness, c) tourist information service, d) safety and security, and e) amenities, e.g. Internet, telecommunication services, money exchange facilities, and medical and educational services (Narayan et al., 2008; Tosun et al., 2015; Zhou et al., 2019). Among these factors, local transport, which provides accessibility to tourism, is deemed essential for destination satisfaction and loyalty

(Narayan et al., 2008). The perception of safety and security is a key factor for destination choice, especially in post-COVID-19 (Van et al., 2020).

Technology promotion

Technology helps to develop and enhance connectivity among stakeholders in an ecosystem (Van Riel et al., 2019), facilitate value co-creation, and benefit all actors in a DTSE (Barile et al., 2017). The effects of technology in tourism service ecosystems have been widely discussed.

From the demand side, social media and peer-to-peer sharing platforms such as Airbnb and Uber are increasingly supporting tourism customers in co-creating value and shaping their travel experience (Buhalis, 2019; Rather et al., 2019; Tung et al., 2018). Through information sharing, tourism customers can influence others' opinions of a destination brand (Dedeoğlu et al., 2020). Sharing can extend the tourism experience in the post-travel stage, reshape the experience, and make the experience more memorable (Dong & Siu, 2013). Therefore, encouraging and helping tourists construct, recall and share their memories should be a part of destination marketing communications (Tung et al., 2018).

From the supply side, the adoption of new technologies enables highly efficient, personalized, and innovative services (Mercan et al., 2020). The use of service robots and human-machine interactive devices has been accelerated, especially during the COVID-19 pandemic (de Kervenoael et al., 2020; Van et al., 2020). The adoption of new technology improves service design and delivery (Polese et al., 2018; Zehrer et al., 2014). Creating a multi-functional digital platform has become an important part of service design, which integrates website (Lin et al., 2020), smart community application (McNaughton et al., 2020), tour recommendation systems (Zheng et al., 2020), and online communities on new social media (e.g. live-streaming platforms) (Lau, 2020).

Tourism service process

In recent research, service design is often defined as a structured service development process that is shaped in accordance with the needs and expectations of the customer (Karadayi-Usta & SerdarAsan, 2020) and motivates them to participate in the service process (Hsieh & Chuang, 2019). The major themes relevant to the tourism service process that

emerged in the literature include customer experience, value co-creation, and service process design.

Customer experience

Creating an unforgettable and satisfying experience seems to have become a consensus goal in most case studies of tourism services (Komppula et al., 2016; Zátori, 2016). Identifying and capturing customers' experiences are prerequisites for the development of the service process (Komula & Lassila, 2015; Patrician et al., 2011). Customer experience can be identified from sensory, affective, cognitive, intellectual, behavioral, relational, social, and other dimensions (Adhikari & Bhattacharya, 2016; Yuan & Wu, 2008; Zomerdijsk & Voss, 2010), among which affective experience receives the most attention. As prominent emotional elements, well-being and happiness are treated as the goal of tourism in general (He et al., 2020; Wu et al., 2017). While relaxation and peace are regarded as the core elements in rural and natural tourism experience (Chin & Lo, 2017; Konu et al., 2010).

Value co-creation

As the emblem of a new service era, value co-creation has been viewed as a key concept in service research (Polese et al., 2018). The studies that involve value co-creation in the selected literature seem to form a series of unified themes: a) the formation of experience and the creation of value appear during the interaction process among customers, service providers and other co-creators, e.g. other customers, residents (Lin et al., 2017) and local organizations (Grissmann & Stokburger-Sauer, 2012; Rihova et al., 2018), and b) active customer participation, which contributes to the value creation efficiency and effectiveness (Hsieh & Chuang, 2019; Malone et al., 2018); and c) the process of co-creating value (Lin et al., 2020; Shin et al., 2020).

Both business-to-customer (B2C) and customer-to-customer (C2C) value co-creation has been examined. However, very few studies have examined the relationship between B2B collaboration and service design (e.g. Lin et al., 2020; Zehrer, 2009). B2C co-creation emphasizes involving customers throughout the entire process of the service experience (Lei et al., 2019; Storey & Larbig, 2018; Thomas-Francois et al., 2017). C2C co-creation involves interactions and shared experiences among customers in tourism settings (Frias Jamilena et al., 2017; Rihova et al., 2015). The service design should exploit the presence of

other customers to make an experience more engaging or enjoyable, for example, through organizing activities involving customer interactions (Liang, 2017), developing a brand (Zomerdijsk & Voss, 2010), or customer communities (Shin et al., 2020).

Service process design

Tourism experience comprises various touchpoints usually provided by different service providers (Avlonitis & Hsuan, 2017). Service design must be carried out in a holistic manner (Zehrer, 2009) that integrates those touchpoints into a complete service delivery network (Avlonitis & Hsuan, 2017). There are three commonly used approaches to service design, i.e. moments of truth, journey mapping, and service blueprinting (Kabadayi et al., 2019).

Our review shows that customer journey mapping combined with moments of truth seems to be the most frequently used tool in tourism service design cases. The perspective of customers is strongly emphasized, rather than balancing the perspectives of both supply and demand sides (Chin & Lo, 2017), and the supply side tends to be ignored in the extant tourism literature.

Towards a conceptual framework

Service design offers a common process and terminology that actors in a system can agree on to work together in offering the service (Avlonitis & Hsuan, 2017). A basic prerequisite to ensure that every actor can effectively apply the service design approach is to share a certain underlying way of thinking (Stickdorn et al., 2014). As a social-ecological system (Levin et al., 2013), there are numerous actors at different layers in a tourism destination, and these entities interact with each other, creating system dynamics. These interactions are not always cooperative, they can be competitive too, as entities may vie for dominance or survival (Moore, 1993). The proposition of DTSE stems from the need to include the social sphere in the analysis of the system's organization dynamics (Polese et al., 2018) and to introduce a systems view on value co-creation and resource integration (Bassano et al., 2019). Therefore, it is necessary to have a universal framework for service design involving all stakeholders in a DTSE to ensure every actor can identify the direction for cooperation to achieve value co-creation, which is important for the sustainability of destination tourism.

Table 2. Main forms of destination tourism management framework in previous studies.

References	Definition	Focus	Main dimensions of destination tourism management
Avlonitis and Hsuan (2017)	Supply and demand structure of destination tourism	B2C; Service delivery	(1) The supply side: a multitude of different businesses from a variety of industries, usually referred to as service providers (2) The demand side: any individual who is capable of traveling, and is quite heterogeneous (3) The intermediaries: tour operators and DMOs who bundle resources provided by various suppliers at host destinations and offer packages to end customers.
Zhou et al. (2019)	Destination service encounter model	B2C; Tourist satisfaction	(1) Enterprise personal interaction encounters (2) Enterprise physical environment encounters (3) Public personal interaction encounters (4) Public physical environment encounters
Chen (2014)	A structure model of tourism supply chain	B&B; Service innovation	(1) Tour customers: the drivers of the supply chain (2) Tourism providers: the core organizations of the TSC (all kinds of firms providing tourism services) (3) Tourism suppliers: the upstream partners of the TSC (tour spots and accommodation organizations) (4) Other tourism partners: upstream and downstream partners in the TSC (transportation firms, logistics providers and other support organizations)
Polese et al. (2018)	Smart tourism service ecosystem	B2C & C2C; Technology application	(1) the main stakeholder groups (actors); (2) the kind of resources exchanged (resource integration); (3) the tools employed (technology); (4) the institution exchange among users (institutions).

Destination as a tourism service ecosystem

Destination tourism services are dynamic and complex (Gopalan & Narayan, 2010), as they involve the participation of tourists and a complex set of stakeholder groups from economic to social (Hillebrand et al., 2015). Most previous studies on destination tourism management pay close attention to the service supply for tourists' satisfaction. Their frameworks are often built on the interaction between tourists and service providers, and the difference in these frameworks is due to the difference in research focus (Table 2). Avlonitis and Hsuan (2017) believe that the destination tourism system is a supply-demand structure with intermediaries (such as tour operators and DMOs) between them. Zhou et al. (2019) propose a model of destination service encounters, in which tourists are in contact with two types of services at destinations: enterprise services offered by tourism enterprises and public services provided by the local government, both of which have significant positive effects on tourist satisfaction. Chen (2014) proposes a structure model of tourism supply chain, in which tourists are customers, tour operators and travel agencies are the core enterprises, tour spots and accommodation are suppliers, transportation companies, support organizations and other logistics providers are partners. What all these frameworks have in common is the emphasis on B2C interaction.

However, in the tourism destination as a social-ecological system, the services are offered by different entities, who can be both cooperative and competitive, or coopetitive, because each of them may have its own objectives but none can survive on its own. Meanwhile, anyone (another tourist or someone who lives and works here) at the destination may exert influence on the tourism experience (Dai et al., 2017; Rihova et al., 2018). The construction of a DTSE thus should go beyond the scope of interaction between customers and service providers to consider all stakeholders to be actors involved in resource exchange and value co-creation (Xie et al., 2020). Extant research on tourism service ecosystem often links with the keywords "smart" and "ICT", regarding the technologies as the strategic tools to enhance value co-creation (Polese et al., 2018; Troisi et al., 2019). Undoubtedly, technology has become indispensable support for a DTSE.

There is still a supply-demand structure in a DTSE. Tourists are the demand-side stakeholders in a DTSE (Chin & Lo, 2017), and are naturally situated in the center of a DTSE (Avlonitis & Hsuan, 2017). The composition of customers varies from destination to destination. The initial step is to identify potential customers and target market segments (Chatterjee & Mandal, 2020). The supply side of a DTSE should go beyond the tourism supply chain and consists of

various providers from different industries, public service sectors, as well as local residents and technologies, all of which have been identified in the above thematic findings. These actors make an internal and external service network for value co-creation (Bassano et al., 2019) and collectively contribute to the provisions of services and customer experiences (Avlonitis & Hsuan, 2017).

A DTSE can be further considered as a two-level nested structure, namely core operational systems and background supportive environment (Figure 3). Physical settings and service provisions are the hard and soft components of the core service supply, which are most relevant to the customer experience and have received the most attention in the literature. The background supportive environment is formed by integrating resources in a broader social environment, including service support provided by stakeholders such as local industries, communities and governments, and technologies. As a vital operant resource, technologies (especially ICT) are the most flexible element in a DTSE (Van Riel et al., 2019). They can bring benefits to all participants and promote value co-creation between service providers and customers (Barile et al., 2017; Cassia et al., 2020). They are to be positioned as the outermost layer in the hierarchical network of DTSE.

The integrated framework of a DTSE defines an extensive and hierarchical supply-demand structure of a destination, and demonstrates the interconnections among stakeholders. Each of them can easily

find its own position and possible external partnerships. The framework also provides a reference direction for resource allocation and service capacity development for DMOs.

Service design blueprint

A service blueprint can be used to depict each activity and step of service production, aiming to improve the service process and delivery (Gyimóthy, 2000; Zehrer, 2009), as if the destination tourism products as a whole were offered by one single entity (Binter et al., 2016). Specifically, the service blueprinting can depict a big picture of the development and design of destination tourism products, in which service concept, service ecosystem (including customers and service supply system) and service process are integrated (Figure 4). Based on the findings from our literature review, the service design blueprint of a destination consists of three hierarchical levels: a) the tourism service concept of a destination, including destination brand and value proposition (Avlonitis & Hsuan, 2017; Chi et al., 2020); b) the tourism service ecosystem of a destination, comprising its supply architecture and customers (Barile et al., 2017; Buhalis, 2019); and c) the service process with Customer Journey Map (CJM) of the target customers (Lin et al., 2020; Rosenbaum et al., 2017).

The service concept is the starting point for tourism service design. It expresses the core value of

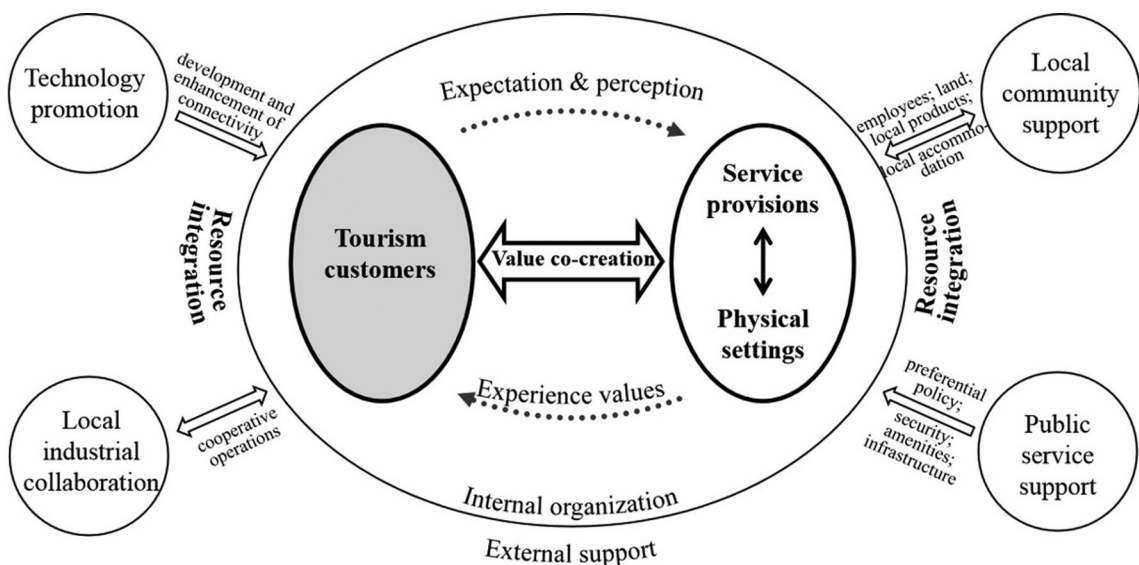


Figure 3. A conceptual framework of a destination tourism service ecosystem.

a destination (destination brand) and service experiences the customer seeks (value propositions). The destination brand defines a clear and consistent direction for DMOs and their actors on the service design. The positioning should be based on a common interpretation of the entire destination (e.g. destination personality and identification) and effectively conveyed to all stakeholders (Bassano et al., 2019). The brand is a promise to the customers about potential experiences in the destination (Chi et al., 2020), and enables all stakeholders in the destination to form a common understanding of the destination's brand value, and participate in the creation and maintenance of the destination brand (Giannopoulos et al., 2020). It is necessary to gain a better understanding of what attracts customers to a specific destination and what the destination can offer to the customers (Bassano et al., 2019). With a consistent vision, an effective service design constantly strives to put forward value propositions that differentiate from its competitors (Zehrer, 2009).

Service demand management is a prerequisite for service design blueprinting and should be carried out in all stages of service design. The focus should be on identifying the key activities and events that

may lead to negative emotions or other undesirable consequences, as well as the service touchpoints that are missing for enabling customers satisfaction (Tomej & Xiang, 2020). Knowledge about the possible benefits of the customers and the anticipated preferences and demands have to be implemented in the service process design (Zátori, 2016).

Service design attaches great importance to systematically engage stakeholders in the process of defining and co-creating the service (Bassano et al., 2019). The task of destination tourism service design is to match the destination supply system with the customer's demand (Karadayi-Usta & SerdarAsan, 2020), combining the value created both by the demand side and the supply side and benefiting all stakeholders (Giannopoulos et al., 2020).

Customer Journey Map (CJM)

CJM is considered as an effective strategic tool for organizing and managing customer experience (Cassia et al., 2020; Lin et al., 2020; Rosenbaum et al., 2017). The core process of destination tourism service design can be conceptualized as a process of CJM. The focus of CJM is to find out the key

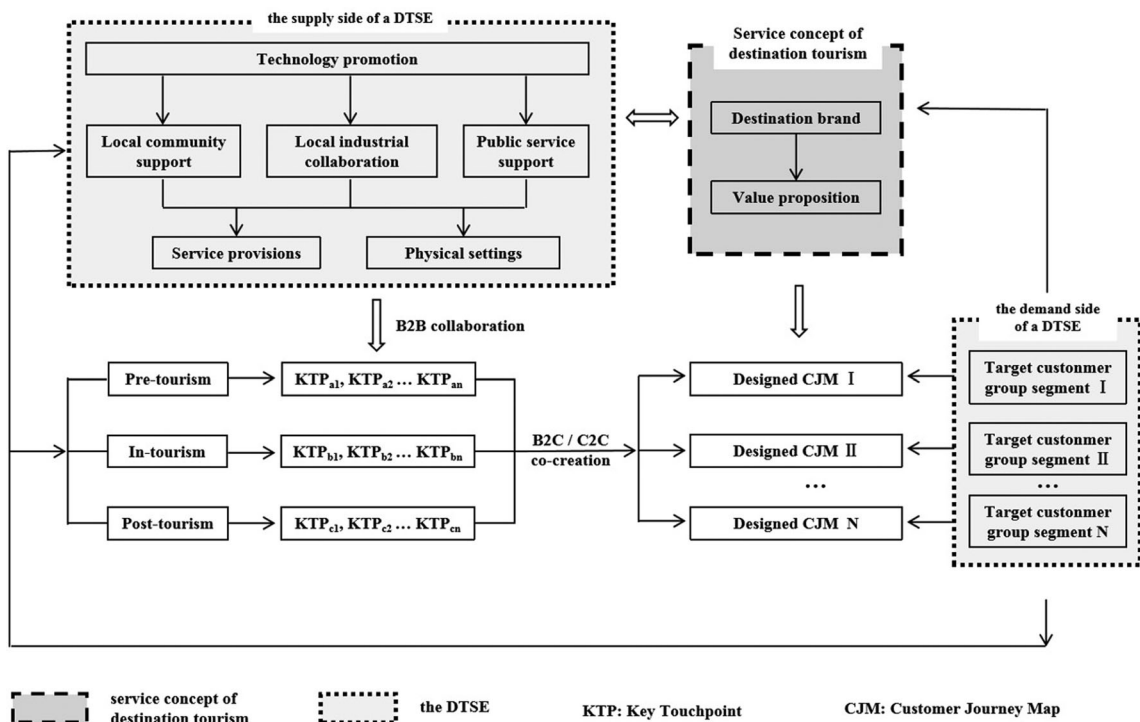


Figure 4. A conceptual model of service design on a destination tourism service ecosystem.

touchpoints for the service provisions and detail the course of action for these touchpoints to provide customers with excellent service (Lin et al., 2020). The key touchpoints can be arranged according to space, time and theme to form a multi-hierarchy structure (Stickdorn et al., 2014).

The chronological blueprint (pre-travel, on-travel and post-travel stages) is the generic sequence to reveal the overall tourism encounters (Gyimóthy, 2000). The whole customer journey starts with information search, destination choice and subsequent trip design, and ends with transferring to another destination or returning home (Cassia et al., 2020). Online Word-of-Mouth (eWOM) has been an essential touchpoint in service design both in the pre-travel and post-travel stages. The DMOs may engage in the pre-travel practices of the customer through social media for destination branding communications (Lin et al., 2020; Mi et al., 2019). Providing timely and personalized responses to customer queries is an effective way of customer management (Chatterjee & Mandal, 2020). It can give the customer a higher sense of empowerment to co-create value on the whole journey, and can even reverse the negative tourism experience after the travel is completed (Shin et al., 2020).

Touchpoint design focuses on looking for possible opportunities for interaction (including B2B, B2C and C2C), and considering the way to unfold these interactions (Giannopoulos et al., 2020) in the physical (e.g. setting related to sight, sound, smell, taste touch and other senses), social (e.g. organized activities, participatory programs), and media (e.g. a coproduction of content on online platforms) environments (Tussyadiah, 2014; Zomerdijs & Voss, 2010).

The CJM design can be divided into two stages. At the first stage, combining the service elements at all levels of a DTSE and the needs, motives and preferences of the customers, a series of key touchpoints should be identified, planned and organized, and opportunities for cross-organization cooperation value co-creation can be proposed. In the second stage of CJM, it is necessary to select the key touchpoints according to the demand of each target customer segment, and then orchestrate the sequence to form several customized CJM schemes. The sequence, progression, and duration of touchpoints can be systematically arranged by dramatic structures (as in novels, plays, and movies) (Zomerdijs & Voss, 2010) or story scripts (Bassano et al., 2019). CJM involves positioning peak moments during the service delivery process, especially at the start and end of visiting the destination.

Case study

In the conceptual model proposed above, identifying and designing the key touchpoints are the core of the service design of a DTSE. We take Tangbu Village, a village in the Zhejiang Province of China as a case to illustrate how the framework of service design can be operationalized by focusing on the touchpoints of CJM, and further discussing how to achieve destination branding and promote value co-creation from the perspective of the government. This case study is carried out on the basis of in-depth observation and interviews with different stakeholders (including tourists, local government, inheritors of intangible cultural heritage, local enterprises and villagers). The whole service design process can be divided into four stages:

- In the first stage, the core service concept of destination tourism is put forward.
- In the second stage, the key touchpoints are identified based on the framework of the DTSE and the chronological blueprint (pre-travel, on-travel and post-travel) is revealed.
- In the third stage, combining the existing key touchpoints and the expectations of tourists visiting Tangbu village, a new framework of the service design with opportunity points is proposed.
- In the last stage, the CJM with peak touchpoints for specific target customer groups is designed, and the strategy of destination branding and the opportunities of value co-creation are proposed.

The first stage: service concept design

Tangbu Village is located in the suburb of Hangzhou metropolis of Zhejiang province of China with a unique intangible cultural heritage of oil-paper umbrella. Integrating the tourism planning of local government and the cognition of villagers and tourists, the oil-paper umbrella is undoubtedly the tourism brand of Tangbu village, which has now been called the “oil-paper umbrella village” by the public. Therefore, an oil paper umbrella village will be regarded as the service concept centered in the process of service design of Tangbu village.

According to the interviews with the government and in-depth observations, the main tourism customer group of Tangbu Village is the family with children. The interviews result with 23 families show

that experiencing the traditional culture and village life is the main tourism motivation. We encourage interviewees to tell their travel stories in detail and capture key information about their needs and expectations. The value propositions catering to tourists are then proposed and refined into nine aspects from four dimensions (functional, cognitive, emotional and social) (see Table 4).

The second stage: identifying existing touchpoints

The customer touchpoints are the focus during the process of tourism, including service, facilities, space and socia media marketing. The framework of the DTSE has defined all the dimensions at which touchpoints can occur and provided support for comprehensively exploring possible touchpoints. Combined with the tourism master plan of Tangbu Village, interviews with tourists and field observations of the research groups, the existing key touchpoints are identified and presented in Table 3 in stages (including pre-travel, in-travel and post-travel), which is corresponded to the dimension of the DTSE. All the key touchpoints constitute the CJM of Tangbu Village during the whole travel experience.

The key touchpoints at the stage of pre-travel and post-travel customer experience are closely related to the technology dimension and the customers themselves, which mainly include the words of mouth from other customers before travel and to other customers after travel, internet platforms visit for information before travel and souvenirs purchase and experiences sharing after travel. There are 19 key touchpoints in the core operational system of a DTSE and 14 key touchpoints in the background supportive system during the travel (Table 3). According to the experience feedback of tourists at each touchpoint, lack of cultural scene and atmosphere is still the main problem, although there are experience courses of oil-paper umbrella making offered by intangible cultural heritage inheritors. So it is necessary to strengthen the destination branding in the process of service design.

The third stage: service design of opportunity points

The touchpoints of tourism experience are designed to meet the true and potential needs of tourists. The expectations of tourists often start from gaining useful information quickly and end at sharing experiences, stories and tips with others. During the travel at

Table 3. Existing key touchpoints based on the tourism service ecosystem of Tangbu village.

	Existing key touchpoints	Dimensions of DTSE		Existing key touchpoints	Dimensions of DTSE
pre-travel	word of mouth	customers	in-travel	international students organization	service provision (intermediary services)
	information on internet platform (Tiktok, Wechat account)	technology promotion		travel agency in Pingyao town	
in-travel	tea plantation	physical settings		family-owned accommodation	local community support
	bamboo grove			local staff	
	insect theme park			factory of oil-paper umbrella	local industry collaboration
	tiny museum of oil-paper umbrella			factory of dried bamboo shoots	
	street landscape			accommodation	
	traditional village buildings			restaurant	
	tour guidance			gift stores	
	front-line employees	service provision (human factors)		outdoor selling area	
	mobile staff			public transportation	public service
	experiencing oil-paper umbrella making	service provision (organized activities)		guiding signs for entrance	
	cherry blossom festival			tourist service center	
	fruit picking activities			parking lots	
	tea picking activities			sanitary facilities	
	experiencing agriculture planting			medical facilities	
	symbol of oil-paper umbrella	service provision (situational factors)	post-travel	online stores (TaoBao)	technology promotion
	tasting dried bamboo shoots			online comments (Wechat, QQ Zone)	
	story of inheritor of intangible cultural heritage			word of mouth	customers

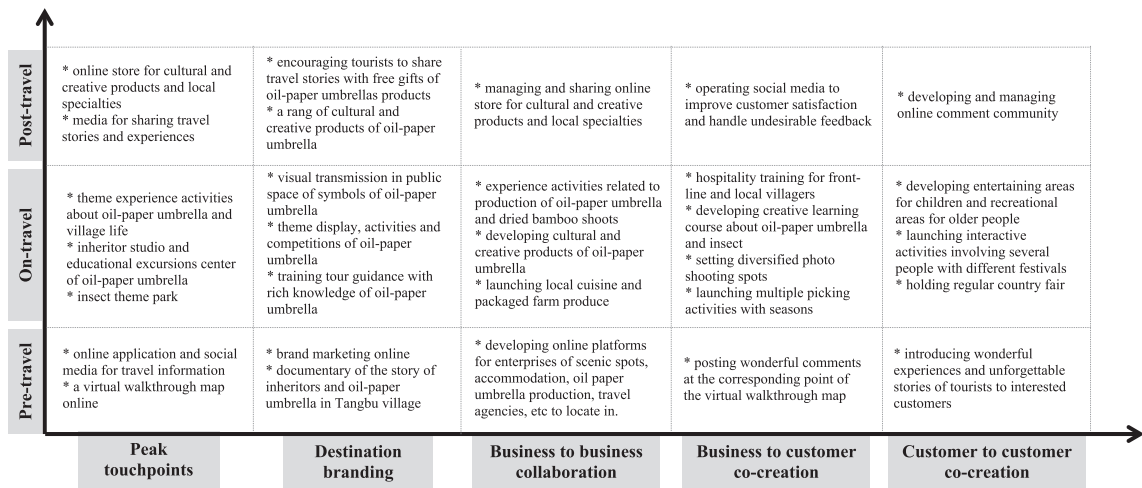


Figure 5. A strategy framework of service design of the tourism service ecosystem of Tangbu village.

Tangbu Village, the family tourists expect to enjoy and learn more about traditional Chinese culture, experience life in the village and improve interpersonal opportunities. Based on the classification of the expectations of tourists, the existing key touchpoints are rearranged to check whether the supply of services matches the needs of tourists, so as to purposefully explore opportunities for service improvement and innovation.

Table 4 lists the service design of possible opportunity points according to each expectation of tourists. Experiencing traditional culture has the greatest impact on the brand of oil-paper umbrella in Tangbu village. Combined with the keywords refined from the travel stories of tourists, six opportunity points are designed: a) visual transmission in public space with the symbols of oil-paper umbrella; b) regular exhibitions of oil-paper umbrella; c) more creative learning courses for children; d) production process display of oil-paper umbrella; e) design competitions of umbrella surface; and f) documentary of the story of inheritors and the oil-paper umbrella.

The fourth stage: strategy framework of service design

Service design emphasizes collective thinking. As each touchpoint does not exist alone, the key to the design of CJM is to integrate all relevant touchpoints as a whole according to the needs of specific customer groups. Due to the complexity of destination tourism, it is difficult to draw a comprehensive service design blueprint. A more effective way is to

position peak touchpoints of the service delivery process which is conducive to determining the clear structure of CJM. Meanwhile, it can also help to achieve efficient destination branding by focusing on the design of key touchpoints.

Each touchpoint involves different stakeholders of tourism services and has different interaction opportunities. The core of the service design strategy is to explore and create opportunities for cooperation to finally promote the value co-creation of the DTSE. A coordinate system can be used to visualize the strategy framework of service design of Tangbu Village (Figure 5). Along the vertical axis, there is the chronological order. Five dimensions of service design strategy including the peak touchpoints, destination branding, B2B collaboration opportunities, B2C and C2C co-creation opportunities are displayed along the horizontal axis. The designed coordinate system presents the key touchpoints of each travel stage to be concerned under each strategic goal, which can be used as a strategic tool for developing innovations in service provision. The framework of service design strategy centered on key touchpoints design allow the village government to develop more effective solutions to complex DTSE and guide related stakeholders to realize value co-creation based on consistent service concept.

An agenda for future research

Based on the findings from our review of the literature, it is possible to outline an agenda for future research.

Table 4. Service design framework of Tangbu Village.

	Existing key touchpoints	Tourists' expectations (core dimensions of experiences)	Service design of opportunity points
pre-travel	word of mouth information on internet platform (Wechat account)	to gain effective and useful information of destination quickly (cognitive)	* developing online application with smart tourism recommendation system * developing mainstream social media (such as TikTok) to share information
in-travel	travel agency in Pingyao town	to reach the destination quickly (functional)	* multiple thematic tourist routes
	international students organization		* a virtual walkthrough map online
	public transportation		* traffic guidance to the expressway exit
	guiding signs for entrance	to enjoy convenient and perfect public service (functional)	* designing the bus stop near the entrance as a landmark
	parking lots		* increasing the size of parking lots
	bicycle renting		* keeping the streets clean and tidy
	sanitary facilities		* an emergency medical treatment station
	medical facilities	to be familiar with the destination, to solve the problem in time (cognitive)	* stylized tourist service center
	tourist service center		* hospitality training for front-line staff and local staff
	tour guidance		* tour guidance with rich knowledge of oil-paper umbrella
	front-line staff	to get close to nature, relieve themselves and stay with family (emotional)	* a set of photograph shooting spots
	mobile staff		* entertaining area for children
	local staff		* recreational area for older people
	tea plantation	to enjoy and learn more about traditional Chinese culture (cognitive)	* facilities for communication activities
	bamboo grove		* visual transmission in public space of with symbols of oil-paper umbrella
	insect theme park		* regular exhibitions of oil-paper umbrella
	cherry blossom festival	to experience life in the village and to improve interpersonal opportunities (emotional & social)	* creative learning course for children
	tiny museum of oil-paper umbrella		* production process display of oil-paper umbrella and dried bamboo shoots
	experiencing oil-paper umbrella making		* design competitions of umbrella surface
	symbol of oil-paper umbrella	to gather with families and fiends, to enjoy local specialties (emotional & social)	* documentary of the story of inheritors and the oil-paper umbrella
	tasting dried bamboo shoots		* hospitality training for local villagers
	story of inheritor of intangible cultural heritage		* renovating buildings and streets with country flavor
	factory of oil-paper umbrella	to share experience, stories and tips with others (emotional & social)	* regular country fair
	factory of dried bamboo shoots		* thematic activities associated with season and festivals
	fruit picking activities		* interactive activities involving several people
	tea picking activities	to gather with families and fiends, to enjoy local specialties (emotional & social)	* a rang of cultural and creative products of oil-paper umbrella
	experiencing agriculture planting		* a series of local cuisine
	street landscape		* differentiated accommodation
	traditional village buildings	to share experience, stories and tips with others (emotional & social)	* packaging products of farm produce
	family-owned accommodation		* rich local products available online
post-travel	accommodation		* managing a social media platform for tourists to tell their travel stories
	restaurant		
	gift stores		
	outdoor selling area		
	online stores (TaoBao)		
	online comments (Wechat, QQ Zone)		
	word of mouth		

First, as this paper is the first to put forward a generic conceptual model of tourism service design on a DTSE, future research is needed to improve the conceptual framework and develop models specific to the different types of destinations. There are many research problems that can be explored further, for example, how to conceptualize a meta-concept from tourism service ecosystem; how to monitor and manage the changes of value

proposition, so as to revise, adjust, position, or re-position the destination brand; and how to use the CJM tool flexibly to improve the capability of service design for the planning and management a DTSE. As service design on a DTSE is a relatively new concept, action research or case study could be adopted as the main research method in future research. More case studies are needed to apply service design methods to enhance the tourism

experience of destinations and innovate tourism services, so as to further enrich and advance the theory development of service design of a DTSE.

Second, the existing literature mainly focuses on two types of co-creation, namely B2C and C2C, therefore, further research should explore the interaction and the collaboration between more stakeholders in the network of a DTSE (e.g. customers, service providers, local industries, local communities, DMOs, local governments), and the corresponding strategy of value co-creation throughout the touchpoints design. The design of the service system from a supply-demand integrating perspective warrants further examination. Most of the previous studies focus on the positive impact of value co-creation on tourism experience, while future studies may examine the factors that lead to cases of failure in value co-creation, some of which might be due to competing interests among actors in the service ecosystem. Our findings suggest that there have been very few that examine B2B collaboration in service design. As coopetition among actors is the norm in an ecosystem, future studies should investigate how actors in the DTSE collaborate to co-create value while competing with each other (Chim-Miki et al., 2020; Czakon & Czernek-Marszałek, 2020; Della Corte & Aria, 2016).

Third, future studies may examine the intermediary roles of background supporting elements of a DTSE in tourism experience, tourism growth and local sustainable development. The strength of local linkages in value chains plays a decisive role in a destination's capacity to gain maximum economic benefits from tourism growth (Thomas-Francois et al., 2017). The link involves not only the direct stakeholders providing tourism services (e.g. hotels, restaurants), but also local agriculture and other related industries. Our literature review shows that, except for the farmer – hotel (or resort) supply chain relationship (Thomas-Francois et al., 2017; Thomas-Francois et al., 2018), there has been limited research on this area. Besides, only in a few rural tourism studies, the specific ways of community and residents participating in tourism service are mentioned (Dai et al., 2017; Peng & Lin, 2016). The community's role in the DTSE should be further emphasized as there is a greater need to integrate residents in the processes of governance and decision-making. The residents that non-directly connect to tourism should be included in the future subject area, as they are also an important part of a DTSE.

Fourth, the wide application of new technologies has greatly advanced innovation in services and enhanced tourist experience (Buhalis, 2019). Future research may explore the promotion of tourism experience, the improvement of tourism service ecosystem operations and the innovation of service design methods. In the context of a smart city, it is increasingly pressing to create and manage an interactive, dynamic and open DTSE in the way of connecting the physical infrastructure of the destination with tourism service providers. Researchers may investigate how deeply digitalization, robotization, and the Internet of Things will penetrate the tourism industries and impact customer experience, especially in post-COVID-19 scenarios.

Fifth, the institutional arrangements and the co-construction and co-sharing of a DTSE requires further investigation. The arrangement of shared institutions (e.g. resource integration mechanism and social rules) is needed to enhance cooperation, optimize resource exchange and co-create value (Polese et al., 2018; Van Riel et al., 2019). Although the role of the institution in the service ecosystem has been recognized, few researchers have paid attention to the composition of the institution and the way the institution works to promote resource integration and value co-creation in a DTSE. We suggest that the institution design (e.g. policies support, performance incentive, interests balance) be included in the destination tourism service design in future research.

Finally, as a destination is a social-ecological system, future research can generate great insights and contribute to the resilience and sustainability of a destination's tourism development (Woodside, 2009; Yang et al., 2018), by examining how the interactions between service providers and tourists evolve over time, and how tourism development impacts the ecological system, and how both the destination social and ecological sub-system interact as a whole to adapt in response to changes in the external environment, particularly the climate change, natural disaster, and the Covid-19 pandemic.

Conclusion

This paper synthesizes the existing knowledge relating to service design and tourism, and provides a foundation for the systematic development of tourism service ecosystem and service design in the destination context. Three core themes revealed from the literature review include service concept,

service ecosystem and service process. Based on the thematic findings, we built a two-level nested framework of a DTSE, which includes core operational systems and a background supportive environment. By integrating service design theory, we further developed an integrated model for the service design on a DTSE, which consists of: a) the tourism service concept of a destination, b) the design of tourism service ecosystem of a destination, and c) the design of service process with CJM. From the results of the literature review, the term “tourism service ecosystem” has been adopted in a few studies (Baccarani & Cassia, 2017; Barile et al., 2017; Polese et al., 2018), research treating a destination as a tourism service ecosystem is still scarce. The approach of “service design” has been used to improve the service process in tourism (Hlee et al., 2019; Liang, 2017; Lin et al., 2020), research applying the service design to systematically develop destination tourism is still sparse.

This study makes three conceptual contributions to the tourism literature. First, we develop a generic conceptual framework of service design on a DTSE, which offers a visual representation of the hierarchical network of a DTSE and a blueprint of destination tourism service design. Second, this study is the first to examine tourism service design based on the service ecosystem, shedding light on the hierarchical level and interconnections of resources and services (elements) of a destination. Third, this study is one of the first to systematically integrate service design thinking into DTSE and propose a research agenda, which opens avenues for future research.

Our conceptual framework provides practical implications for resource integration and value co-creation by service design for all the stakeholders involved in a DTSE. First, the service design was carried out in the pursuit of a common brand reputation (service concept), which helps promote the competitiveness of DTSE as a whole entity. Second, the important interactions (including B2B, B2C and C2C) were focused on the design of key touchpoints in the CJM towards a consistent goal. The collective approach allows DMOs to develop more innovative, customer-friendly, and effective solutions to complex behavioral, economic, and social issues. Third, it is easy for service providers to find their positions in the blueprint and the possible external partnerships, which can help to effectively organize the operations and service processes accordingly and clarify the direction for cooperation with other stakeholders.

The findings of this study are limited to the 103 articles reviewed during 2000–2020 time period. Expanding the scope of our search keywords may result in slightly different results. The conceptual framework proposed in this paper is developed in a generative and exploratory way and may not represent every aspect of the service design for DTSE. Therefore, further research is required to refine and validate the theoretical framework. Despite the limitations, our literature review findings and our proposed conceptual framework and research agenda will help tourism managers and scholars to address the important issues of service design, tourism experience, and destination competitiveness and sustainability.

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