Managing sustainability-oriented innovation in services: proposal of a scale for the future of hotel companies and travel agencies

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Abstract

Purpose – *The concept of Sustainability-Oriented Service Innovation (SOSI) has been recently suggested from a conceptual reflection approach in an attempt to integrate innovation and sustainability in services, being an emerging field of innovation in services. This study aims to propose a scale to measure Sustainability-Oriented Service Innovation from the perspective of the company. Because the whole is different from the sum of its different parts, we need to better understand the synergy between sustainability and innovation for the future of tourism companies.*

Design/methodology/approach – *Upon a literature review, we propose a scale and explore its dimensionality with data from 268 to 256 Spanish hotel and travel agency managers, respectively. The dimensionality of the scale for measuring Sustainability-Oriented Service Innovation is similar in hotels and travel agencies.*

Findings – *Five factors emerge from the principal component analyses carried out: two dimensions referred to technological and non-technological innovation, respectively, and three dimensions labelled as economic, social and environmental sustainability.*

Practical implications – *To guide managers towards their operations, the proposed scale is expected to inspire models to assess the impact of SOSI practices in such a highly competitive industry and to identify the most influencing dimensions on the future performance of the tourism company.*

Originality/value – *To the best of our knowledge, no scale has been presented so far that brings together the dimensions of technological and non-technological innovation, as well as sustainability from a Triple Bottom Line approach.*

Keywords *Innovation, Sustainability, Scale, Hotel, Travel agency*

Paper type *Research paper*

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1. Introduction

Sustainability and new technologies have been identified among the main trends associated with the future of tourism in Europe (Ferrer-Roca *et al.*, 2021). Indeed, the ability to compete of business organizations is increasingly influenced by their relationship to sustainability and innovation, operating separately (Hitchens *et al.*, 2005) or both synergically (Esty and Winston, 2009). By embracing the development of innovative technologies and processes, companies can generate new markets for environmental-friendly products (Beise and Rennings, 2005), or improve the efficiency of energy, water and waste management systems, while protecting biodiversity and creating the conditions for growth and sustainable development of local communities (Buhl *et al.*, 2016), for instance.

In the case of tourism organizations, being perceived as sustainable is vital for their survival and development, due to the impact of tourism activity on the environment and the manifold stakeholders involved in their operations (Cavalcante *et al.*, 2021). Innovation is required to promote the tourist acceptance of the sustainable practices implemented by the organization (Iniesta-Bonillo *et al.*, 2016; Grilli *et al.*, 2021), and to engage tourists in sustainable behavior during their interactions with the tourism company (Li and Wu, 2020). However, research in tourism companies has mainly addressed innovation and sustainability separately (Ozturkoglu *et al.*, 2021). Moreover, regarding innovation, the literature in tourism has mainly focused on the narrower technology-driven innovation (Martín-Rios and Ciobanu, 2019), whereas it has been claimed the need to consider both technological and non-technological innovation, thus adopting an integrated approach (Bilgihan and Nejad, 2015). Similarly, most of research in sustainability has mainly addressed environmental sustainability as a "default position" (Moyle *et al.*, 2021), thus neglecting the economic and social dimensions of sustainability, that should be also considered from a Triple Bottom Line (TBL) approach (Elkington, 2004). Additionally, the impact that the health emergency derived from COVID-19 have had consequences on the way companies understand the sustainability and the innovation, in light of the strong negative impact of the pandemic on the tourism sector, on the one hand, and the UN World Tourism Organization's commitment to the responsible recovery of sustainable tourism to restart tourism (UNWTO, 2023), on the other.

In an attempt to integrate innovation and sustainability in services, recently the concept of Sustainability-Oriented Service Innovation (hereafter SOSI) has been suggested from a conceptual reflection approach, as an emerging field of innovation in services, which attempts to respond to the current challenge of environmental, social and economic sustainability (Calabrese *et al.*, 2018a). Notwithstanding, even if managers are aware of the need to introduce innovations to achieve the integration of the objectives of innovation and sustainable development, firm innovation strategies are often inadequate to respond to the highly complex and uncertain nature of these new demands. The complexity of these strategies is due to the fact that, unlike conventional market-driven innovation, service innovation oriented to sustainability copes with challenges such as a greater number of stakeholders, in addition to the uncertainty related to sustainable innovation (Saviano *et al.*, 2017; Calabrese *et al.*, 2018b; Gil-Saura *et al.*, 2023). In spite of the increasing interest in this kind of innovation and the calls for both theoretical and practical research in this topic, theories, models and tools to foster sustainable innovation in services are still scarce in the literature (Baldassarre *et al.*, 2017; Calabrese *et al.*, 2018b; Gil-Saura *et al.*, 2023), and in particular, the need for further research in Sustainability-Oriented Innovation -SOI- in Tourism has been highlighted (Garay *et al.*, 2019; Tiwari and Thakur, 2021).

Because the whole is different from the sum of its different parts (Stoyanov, 2022), we need to better understand the synergy between sustainability and innovation. To the best of our knowledge, no scale has been presented so far that brings together the dimensions of technological and non-technological innovation, as well as sustainability from a Triple Bottom Line approach. The present study strives to overcome this research gap by proposing a scale for SOI in tourism companies from the manager perspective. In particular, from an exploratory approach, we aim at analyzing the dimensionality of a proposed scale for SOSI built from previously validated subscales and its similarities for two types of tourism companies, that is hotels and travel agencies. In this way, the dimensionality of the proposed scale to integrate innovation and sustainability is analyzed in hotels and travel agencies to identify the similarities and differences in SOSI in these two settings.

2. Theoretical framework

Climate change and ecological disturbances pose severe challenges to the present and future generations, and demand a shift in considering tourism merely as a service industry but as a phenomenon that may increase people's consciousness to maintain sustainability in the future (Bhalla and Chowdhary, 2022). Companies are increasingly influenced by internal and external forces that are driving them to adopt their business models and strategies to sustainability

(Preghenella and Battistella, 2021). In this context, sustainable business model innovation emerges a key success factor for companies that aim at integrating sustainability in their strategies (Lüdeke-Freund, 2020). Aligned with this notion, recent studies have pointed out service innovation for sustainability among the main types of innovation (Djellal and Gallouj, 2015; Calabrese *et al.*, 2018b), claiming for research on a holistic conceptualization of what has been coined as Sustainability-Oriented Service Innovation (SOSI) (Calabrese *et al.*, 2018a).

Focusing on tourism companies, traditionally, research has considered innovation and sustainability separately, and in the case of both constructs, a narrow vision has been adopted, focused on technological innovation and environmental sustainability, respectively. Even if there are some studies jointly focusing on sustainable service innovation, they have mainly focused on the environmental dimension of sustainability (Ozturkoglu *et al.*, 2021).

2.1 Innovation in tourism organizations

One of the major trends in tourism futures is digital innovation driven by increasingly hyper-connected societies, markets and industries (Carlisle *et al.*, 2023). According to the latest edition of the OECD Oslo Manual, innovation is defined as *"the implementation of new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations"* (Mortensen and Bloch, 2005, p. 46). From this definition, four types of innovation have been distinguished (Gomezelj, 2016). In the context of the tourism industry, firstly, product innovation is related to the development and introduction of a new service through the use of new knowledge and technologies, or new combinations of existing knowledge and technologies (Martín-Rios and Ciobanu, 2019). Secondly, process innovation refers to the introduction of a new or significantly improved service delivery method to either reduce costs of delivery or to enhance service quality (Mortensen and Bloch, 2005). Thirdly, marketing innovations include the implementation of substantial changes in the commercial variables, that is product design or branding, pricing, communications or distribution (Mortensen and Bloch, 2005) to strengthen the firm competitive position (Line and Runyan, 2012). In this type of innovation, it has been included innovation in external relations, or relational innovation, defined as new ways to interact with customers and suppliers (Djellal and Gallouj, 2001; Drejer, 2004). Last, organizational innovation involves the implementation of changes in business practices, workplace organization or external relations to upgrade the company's effectiveness or performance (Mortensen and Bloch, 2005).

These types of innovation are grouped into technological innovations, that is product and process innovations, and non-technological innovations, which gather marketing, relational and organizational innovation (Gomezelj, 2016; Martín-Rios and Ciobanu, 2019). Tourism companies, and in particular, the hospitality sector, invest in technological innovation less than other service industries, due to the characteristics of its activity, for example seasonal, labor-intensive, cost-driven industry (Martín-Rios and Ciobanu, 2019). Moreover, the innovative potential in non-technological innovations for hospitality and tourism firms is argued to be limited due to the difficulty to attract qualified and motivated personnel due to seasonality and low wages, and the consequent lack of skilled human capital (Gomezelj, 2016). Thus, academic research in tourism dealing with innovation is scarce and mainly focused on the impact of information and communication technologies (Khatri, 2018; Nguyen *et al.*, 2021; Pencarelli *et al.*, 2021). Further theoretical and empirical research is required to shed light on the determinants of technological and non-technological innovation strategies in hospitality and tourism organizations (Martín-Rios and Ciobanu, 2019).

2.2 Sustainability in tourism organizations

The earliest and most cited definition of sustainability was provided by Brundtland (1987, p. 40) as the *"[..] development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. To guide managers towards the sustainable operations,

Elkington (1997) suggested the Triple Bottom Line model to measure impact of economic sectors on People, Planet and Profit, related to the social, environmental and economic dimensions of sustainability, respectively. Thus, sustainability in the hospitality industry involves balancing social and cultural well-being, economic performance and wise consumption of natural resources (Jones *et al.*, 2014).

Many studies in sustainability in tourism address only limited aspects of sustainability rather than adopting a holistic perspective (Moyle *et al.*, 2021), and the literature calls for further research on sustainability from a TBL approach (Csikósová *et al.*, 2020; Khatter *et al.*, 2021; Moyle *et al.*, 2021). Examples of proposals to measure the perceived importance of TBL sustainability as reported by managers of tourism organizations are limited (e.g. Stylos and Vassiliadis, 2015; Csikósová *et al.*, 2020). In recent research, Csikósová *et al.* (2020) use a joint sustainability index to assess the three dimensions of sustainability for the hospitality sector. In particular, as indicators of the economic dimension (Profit), firm revenues and profit are considered. For social sustainability (People), employee and guest satisfaction are measured. Last, as far as environmental sustainability is concerned (Planet), energy and water consumption, and waste management are considered. Although the index is argued to be a useful tool to compare companies in this industry and identify areas of improvement to enhance the firm competitive advantage, the authors share their concerns about the challenges of measuring the social and the environmental dimensions in same way worldwide.

2.3 Sustainability-oriented innovation in tourism organizations

The literature has pointed out the relations between innovation and sustainability in tourism companies (Elmo *et al.*, 2020). These two constructs have been interconnected through the concept of Sustainability-Oriented Service Innovation (Calabrese *et al.*, 2018a). This theoretical framework emerges from the conjunction of three concepts, namely Sustainability-Oriented Innovation (SOI), Product-Service System (PSS) and Service Innovation (SI), as well as all those studies on the relations between services, innovation and sustainability. In particular, research on SOI considers the design, development or delivery of new or improved service offerings, as well as implementation of new sustainability-oriented organizational practices, activities and processes. Studies focused on PSS encompass the development and provision of service offerings to address sustainability issues, while generating revenue for organizations. Last, SI to address environmental, social and economic sustainability issues involves the introduction of new or enhanced products, processes, marketing actions or business practices.

Scarce contributions have been observed in sustainability-oriented service innovation research and practice so far. For instance, the SOSI tool has been proposed by Calabrese *et al.* (2018b) to foster innovation in business model for sustainability. This operational tool suggests four macro-factors (i.e. design of new service offerings, integration of companies with their customers, changes in the service delivery structure and impacts, in terms of economic, social and environmental benefits and costs), that are, in turn, characterized by a series of micro-factors. The SOSI tool is argued to enable managers to support sustainability-oriented service innovation through the holistic alignment of new technologies, new approaches to customer relations and interactions and new service designs and partnerships related to sustainability goals from a Triple Bottom Line perspective (Calabrese *et al.*, 2018b). Therefore, this tool encompasses both technological and non-technological innovation, as well as economic, social and environmental sustainability.

To test a model on sustainability-oriented innovations in water management in tourism, Garay *et al.* (2019) adapt and extend the Decomposed Theory of Planned Behavior, commonly used to analyze technological innovations, to integrate beliefs that inform attitudes, social norms and perceived behavioral control. In this way, the authors contribute to predict tourism managers' behavioral intentions toward sustainability-oriented innovations through their beliefs in relation to their attitudes, social norms and perceived behavioral controls. Similarly, Rahimizhian and Irani (2021) found evidence on the existence of a notable effect of constructive leadership on

employees' innovative work behaviors in green hotels in Turkey. The authors conclude that innovative employees are particularly needed in dynamic and highly competitive sectors such as the hospitality industry.

In the context of food and beverage industry, Ozturkoglu *et al.* (2021) propose a framework coined as Sustainability-Oriented Hospitality Service Innovation (SOHSI) to explore the relationship between service innovation and the Triple Bottom Line dimensions of sustainability. The authors conclude that food and beverage services companies should pay specific attention to "environmental entrepreneurship," "interior design" and "brand management" dimensions to make their innovative services more sustainable. Notwithstanding, these conclusions are rather specific to the food service sub-sector, not suitable for being extrapolated satisfactorily to the other sub-sectors in the tourism industry, and the authors claim for research in other areas of activity in hospitality.

In addition to this, macroenvironmental forces, such as the outbreak of the COVID19 pandemic, require to analyze how companies integrate innovation and sustainability to face the challenges posed by the changing patterns of consumers (Kyriakou, 2021; Euromonitor International, 2022). The development of measurement tools is especially important in the case of tourism companies, since it has been one of the most impacted sectors by the pandemic, and where resilient companies have adopted a sustainable tourism approach (Sobaihet *et al.*, 2021), and relevant players, such as the UN World Tourism Organization (UNWTO, 2023) suggest sustainability and innovation as "the new normal". Several practices have been suggested (e.g. open innovation to foster opportunities for corporations to work with start-ups in making new processes easier, quicker to implement and more efficient; innovate in business models, communications and experiences; transition to more resource efficient and low carbon tourism to adapt and mitigate the Climate Crisis), and the relevance of measuring and monitoring the results of these sustainability-oriented innovations in tourism companies has been highlighted (UNWTO, 2023).

However, in spite of the calls for further research in sustainable innovation in services (Baldassarre *et al.*, 2017; Calabrese *et al.*, 2018b), to the best of our knowledge, no progress has been made to measure the level of sustainability-oriented innovation in a tourism organization as a whole. Moreover, subsectors in the tourism industry, such as hotels and travel agencies, are very different from each other and would require different approaches. In this sense, for instance, energy and water consumption, and waste management may be highly relevant in hotels, whereas in travel agencies, whose environmental footprint has much to do with transportation and less with water consumption and waste generation, GHG emissions should be considered. In an attempt to fill this gap, we propose a scale to assess SOSI in tourism companies from the manager perspective. Therefore, we posit the following research question:

What are the dimensions of a proposed scale for SOSI in hotels and travel agencies?

3. Methodology

To achieve the proposed objective, we carried out quantitative research through a structured questionnaire. All scales integrated in the proposed instrument were adapted from previous studies in industrial settings. Even if most of these scales have been applied to tourism companies, they were measuring only partial aspects of sustainability-oriented innovation, and not assessing this construct as a whole. To align our scale proposal with the theoretical basis of the SOSI framework, we have considered a scale for measuring technological development as a way to assess SI, a scale including TBL sustainable practices for SOI, and a scale for relational innovation that reflects external relations as a tool to assess PSS. The scales were selected according to their appropriateness to measure the constructs which were identified as relevant for this research and verifying that their psychometric properties were adequate. Specifically, the scale used to measure the degree of technological development (e.g. Information and Communication Technologies or ICT) is adapted from Wu *et al.* (2006) (4 items) and has been often used for measuring perceptions of the technologies implemented by tourism companies (e.g. Ruiz-Molina *et al.*, 2018). To measure TBL sustainable practices, a scale proposed by Xu and Gursoy (2015) is considered (15 items),

since it is contextualized in the hospitality industry. Given the personal nature and the constant interaction of the staff of tourist organizations with their customers, inspire employees to create and develop good relationships with customers (Castellanos-Verdugo *et al.*, 2009), we focus on relational innovation to measure non-technological innovation, adapting the items to measure relational innovation from Homburg *et al.* (2002) (3 items) and Oke and Idiagbon-Oke (2010) (4 items). All items have been measured using a 7-point Likert scale. Classification variables were included at the end of the questionnaire.

To perform the present study, two types of tourism company were considered: hotels and travel agencies. With regard to hotels, the database of companies in the sector was obtained from researchers' listings from hotel directories in Spain from previous studies; this information was completed with the details of companies obtained from available secondary sources of information, that is SABI and DUNS 100,000 databases. In this way, a list of 750 hotels, which included 3, 4 and 5-star hotels was drawn up in the autonomous regions of Catalonia, the Valencian region and the region of Madrid. During the fieldwork, which was personally administered (face-to-face, when possible, or by phone), 681 hotels were contacted, under a designed sample of 250 interviews, finally obtaining 268 valid questionnaires (83 in Barcelona, 104 in Valencia and 81 in Madrid), thus achieving a response rate of 39.5%. The contact process (up to 5 iterations) was initially carried out by telephone, making an appointment to administer the questionnaire face-to-face or by phone, or alternatively providing the link to the online questionnaire. The key informant was the responsible hotel staff (managerial position). Table 1 shows the details of hotel sample distribution.

Regarding the fieldwork on travel agencies in Spain, the data base of companies in this sector was obtained from the researchers' lists prepared for previous studies, as well as additional companies identified using the ALIMARKET and DUNS 100.0000 databases. In this way, a list of 900 travel agencies in the autonomous regions of Catalonia, the Valencian region and the region of Madrid was drawn up. During the field work, 833 agency managers were contacted, under a designed sample of 250 interviews, and finally 256 valid questionnaires were completed (77 in Barcelona, 102 in Valencia and 77 in Madrid) thus achieving a 27.9% response rate. The contact process (up to 3 iterations) was initially carried out by phone, setting an appointment to administer the questionnaire in person or by phone, or through the online questionnaire. The key informant was the manager of the travel agency. Table 2 shows the details of the sample distribution for travel agencies. Both fieldworks, hotels and travel agencies, were personally administered in 2018.

In reference to possible self-selection and non-response bias, we applied different tests to verify information validity. Thus, we compared the possible association of descriptive variables for the companies among those which had replied to the questionnaire (268 hotels and 256 travel agencies) compared to those which did not (413 hotels and 577 travel agencies). In particular, there were no significant differences in company size, measured as average yearly number of employees (p-value for the average differences T-test >0.05). From the analyses conducted, we infer that self-selection bias is not relevant and the samples are representative of population.

Table 1 Hotel sample profile

	N	%		N	%
Hotel category			Relation with the main travel agency/reservation centre		
Three stars	113	42.2	Retail travel agency/reservation centre	151	56.3
Four stars	136	50.7	Wholesale travel agency/reservation centre	117	43.7
Five stars	19	7.1			
Location					
City	234	87.3			
Coastside	25	9.3			
Others	9	3.4			

Source(s): Table by authors

Table 2 Travel agency sample profile

	N	%
Customer type with the highest sales percentage (multiple choice)		
•Families/individuals	148	57.8
•Travel agencies (Tour operators)	26	10.2
•Event organizers	18	7.0
•Companies	86	33.6
•Education institutions	17	6.6
•Groups	7	2.7
•Seniors	7	2.7
•Others	7	2.7
Number of employees		
•10or less	188	73.4
•11–25	39	15.2
•26–50	15	5.9
•More than 50	9	3.6
•NA	5	2.0
Distribution channel		
•Only physical	145	56.6
•Only online	13	5.00
•Blended	99	38.7
Type of travel agency		
•Tour operator	4	1.6
•Wholesaler	18	7.0
•Retailer	161	62.9
•Wholesaler and retailer	73	28.5
Firm age		
•Less than 10 year old	36	14.1
•10–20 year old	93	36.3
•21–30 year old	71	27.7
•More than 30 años	44	17.2
•NA	12	4.7

Source(s): Table by authors

In order to achieve the proposed objective, exploratory analyses are carried out through Principal Component Analysis (PCA) to study the dimensional structure of the constructs included in the proposed model, both for hotels and for travel agencies.

4. Analysis of results

Firstly, to identify the structure of the relationships between the variables that constitute the scale of Sustainability-Oriented Service Innovation, a PCA with VARIMAX rotation was carried out to analyze the existence of a factor structure for SOSI in hotels. After eliminating four items (i.e. RI1, Sust6, Sust7 and Sust8) due to factor loadings lower than 0.55, the use of this statistical technique for our data was supported several indicators based on the correlation matrix, as shown in Table 3.

Table 3 Rotated component matrix: hotels

	1 Technol. Innov.	*2 Relational Innov.*	*3 Eco. Sustain.*	*4 Social Sustain.*	*5 Environ. Sustain.*
ICT1. This hotel invests in technology	*0.826*	0.248	0.009	0.106	0.140
ICT2. This hotel has the most advanced technology	*0.828*	0.322	0.056	−0.058	0.184
ICT3. In comparison to its competitors, this hotel's technology is more advanced	*0.787*	0.297	0.062	0.028	0.164
ICT4. This hotel considers the opinion of customers on decisions involving IT coordination and development in order to improve services and to better satisfy customers' needs	*0.570*	0.250	0.051	0.566	0.069
RI2. This hotel adopts innovations or new services ideas in their relations with customers more quickly than other hotels	0.542	*0.658*	0.146	−0.103	0.162
RI3. This hotel adopts innovations or new services ideas in their relations with customers over time relative to other hotels	0.464	*0.600*	0.079	0.303	0.176
RI4. This hotel works towards attaining similar goals to those of its customers: it innovates to align its objectives to those of customers	0.271	*0.715*	0.073	0.257	0.214
RI5. This hotel innovates to reduce or eliminate frictions with customers	0.239	*0.592*	0.116	0.503	0.140
RI6. This hotel innovates to make relationships with their customers close and personal	0.275	*0.831*	0.132	−0.031	0.225
RI7. Thanks to the innovations of this hotel, there is a good relationship with its customers	0.267	*0.815*	0.145	−0.016	0.227
Sust1. This hotel attaches great importance to revenue growth	−0.002	0.128	*0.910*	0.133	0.146
Sust2. This hotel attaches great importance to cost control	0.072	0.076	*0.870*	0.152	0.152
Sust3. This hotel attaches great importance to market share growth	0.094	0.159	*0.921*	0.123	0.155
Sust4. Our hotel is concerned about employee well-being	−0.011	0.162	0.225	*0.683*	0.424
Sust5. Our hotel is concerned about customer well-being	−0.022	−0.039	0.197	*0.824*	0.168
Sust9. Our hotel purchases environmentally sustainable products	0.020	0.323	0.083	0.056	*0.799*
Sust10. Our hotel manages environmentally sustainable services	0.081	0.298	0.083	0.044	*0.850*
Sust11. Our hotel manages the product during use so that it does not go to waste	0.073	0.198	0.231	0.277	*0.693*
Sust12. Our hotel is concerned about product life extension	0.112	0.044	0.171	0.280	*0.757*
Sust13. Our hotel implements a recycling program	0.142	−0.016	0.044	0.170	*0.793*
Sust14. Our hotel controls the pollution it generates	0.176	0.206	0.138	−0.018	*0.810*
Sust15. Our hotel implements environment management systems	0.193	0.089	0.041	0.068	*0.812*

Note(s): KMO: 0.886; determinant: 9.74E−009; Bartlett's test of sphericity (sign. level): 0.000
Source(s): Table by authors

Table 4 Rotated component matrix: travel agencies

	1 Technol. Innov.	*2 Relational Innov.*	*3 Eco. Sustain.*	*4 Social Sustain.*	*5 Environ. Sustain.*
ICT1. Both our partner and our travel agency always work together for the best IT alignment	*0.908*	0.174	0.071	−0.008	0.099
ICT2. IT advances between our partner and our travel agency, are well aligned for best supply chain performance	*0.941*	0.145	0.053	0.007	0.062
ICT3. This travel agency has the most advanced technology	*0.901*	0.219	0.058	0.086	0.043
ICT4. In comparison to its competitors, this travel agency's technology is more advanced	*0.660*	0.371	0.038	0.158	0.124
RI1. This travel agency adopts more innovations or new services ideas in their relations with customers than other agencies	0.269	*0.793*	0.120	−0.064	0.265
RI2. This travel agency adopts innovations or new services ideas in their relations with suppliers and customers more quickly than other agencies	0.289	*0.745*	0.216	−0.135	0.272
RI3. This travel agency adopts innovations or new services ideas in their relations with providers and customers over time relative to other agencies	0.323	*0.779*	−0.017	0.108	0.241
RI4. This travel agency works towards attaining similar goals to those of its providers: it innovates to align its objectives to those of final customers	0.304	*0.703*	−0.129	0.278	0.135
RI5. This travel agency innovates to reduce or eliminate frictions with providers and customers	0.068	*0.830*	0.157	0.273	0.118
RI6. This travel agency innovates to make relationships with their providers and customers close and personal	0.088	*0.849*	0.119	0.142	0.098
RI7. Thanks to the innovations of this hotel, there is a good relationship with its providers and its customers	0.081	*0.829*	0.191	0.112	0.161
Sust1. This travel agency attaches great importance to revenue growth	0.152	0.128	*0.845*	0.190	0.054
Sust2. This travel agency attaches great importance to cost control	−0.041	0.060	*0.774*	0.228	0.054
Sust3. This travel agency attaches great importance to market share growth	0.080	0.177	*0.854*	−0.103	0.115
Sust4. Our travel agency is concerned about employee well-being	0.089	0.209	0.203	*0.843*	0.219
Sust5. Our travel agency is concerned about customer well-being	0.071	0.161	0.149	*0.904*	0.111
Sust9. Our travel agency purchases environmentally sustainable products	0.039	0.275	0.267	0.035	*0.811*
Sust10. Our travel agency manages environmentally sustainable services	0.063	0.272	0.308	−0.095	*0.770*
Sust13. Our travel agency implements a recycling program	0.048	0.119	−0.182	0.408	*0.666*

(*continued*)

Table 4 Continued

	1 Technol. Innov.	2 Relational Innov.	3 Eco. Sustain.	4 Social Sustain.	5 Environ. Sustain.
Sust14. Our travel agency controls the pollution it generates	0.023	0.182	−0.014	0.248	*0.808*
Sust15. Our travel agency implements environment management systems	0.180	0.117	0.006	0.046	*0.766*

Note(s): KMO: 0.858; determinant: 9.42E−009; Bartlett's test of sphericity (sign. level): 0.000
Source(s): Table by authors

Table 5 Reliability coefficients Cronbach alpha for the factors resulting from the PCA

Construct	*Hotels*	*Travel agencies*
Technological innovation	0.856	0.919
Non-technological innovation	0.905	0.934
Economic sustainability	0.923	0.817
Social sustainability	0.756	0.919
Environmental sustainability	0.921	0.862

Source(s): Table by authors

The results show the existence of five well differentiated factors, which have been labelled as follows: "technological innovation" (related to the degree of ICT advancement), "relational innovation" (as the most relevant type of non-technological innovation in tourism organizations) and the three dimensions of sustainability following the Triple Bottom Line (economic, social and environmental sustainability). These five factors jointly explain 76.12% of the total variance.

Similarly, the PCA is carried out with VARIMAX rotation for the sample of travel agencies. In this case, the five items (i.e. Sust6, Sust7, Sust8, Sust9 and Sust12) were eliminated due to not reaching the minimum value of 0.55 in any of their factor loadings. The final rotated component matrix is shown in Table 4.

As in the case of hotels, the exploratory factor analysis results in five factors: "technological innovation", "non-technological innovation", "economic sustainability", "social sustainability" and "environmental sustainability". The five factors obtained for the sample of travel agencies jointly explain 77.47% of the total variance.

All the factors show adequate values for their respective reliability coefficients (see Cronbach's alpha values in Table 5), as they are higher than the reference values of 0.7 and 0.8.

5. Discussion

Sustainability-Oriented Innovation has emerged as a multidimensional construct for both hotels and travel agencies, going beyond the conceptualization of Calabrese *et al.* (2018a, b) to propose an operational tool for benchmarking. Moreover, although hotels and travel agencies are well differentiated in terms of the degree of tangibility of the combination of products and services they offer, from the results obtained for the exploratory analysis of the proposed scale of Sustainability-Oriented Innovation, it can be concluded that both types of tourism company have important points in common with regard to the factor structure of the proposed construct. In particular, the existence of five factors is inferred, which we have called: "technological innovation" (relative to the degree of ICT advancement), "non-technological innovation" (represented by relational innovation) and the three dimensions of sustainability according to the Triple Bottom Line stated by Elkington (1997), that is economic, social and environmental sustainability. Thus, although in both types of

tourism company sustainability can be considered a second-order construct with three dimensions, social sustainability is reduced in both cases to relationships with employees and customers. The key role of employees in the implementation of sustainable innovative practices supports the findings of Rahimizhian and Irani (2021), among others. The items to measure social sustainability referred to other interest groups (suppliers, local community and public administrations) are excluded from the factor structure that emerges from the managers' responses of both types of tourism companies, that is hotels and travel agencies.

6. Conclusions

Based on the idea that the whole is greater than the sum (Stoyanov, 2022) and to take into account the synergy between innovation and sustainability, our analysis goes beyond previous studies. We point out that it is possible to define a unique construct, Sustainability-Oriented Innovation, combining innovation and sustainability in a multidimensional concept. Hotels and travel agencies are two types of tourism business that are well differentiated, but show similarities with regard to the factor structure of the proposed construct. Specifically, in reply to our research question (i.e. *What are the dimensions of a proposed scale for SOSI in hotels and travel agencies?*), from the analyses carried out, the existence of five factors is inferred, which we have called: technological innovation, non-technological innovation, economic sustainability, social sustainability and environmental sustainability.

The main theoretical contribution of this research consists in proposing a tool to measure the level of sustainability-oriented innovation in a tourism organization as a whole, which seems to be transferable to different types of players (i.e. hotels and travel agencies) as far as the same first-order dimensions have been identified for the two types of companies under study. Moreover, in the measurement of the sustainable practices we have selected a scale responding to Elkington's (2018) concerns, in the sense that the TBL should not be considered as an accounting tool, as misunderstood by the Global Reporting Initiative and manifold companies and researchers, but to focus on the wellbeing of people and the health of the planet.

From a managerial standpoint, the proposed scale may respond to the need of some form of accreditation system in sustainability for the tourism industry on a European level identified by Ferrer-Roca *et al.* (2021). At individual level, companies may find interest in using the proposed scale as a self-diagnosis tool which may enable the identification of the main strengths and gaps in the company's business model and strategies to improve the firm competitiveness in the future environment, characterized by increased rivalry. Moreover, even if with some restrictions due to lack of some relevant information about competition, it can be used as a benchmark instrument and to identify the positioning of the company in its competitive landscape. This tool may equip hotel and travel agency managers to become constructive leaders who cultivate a green environment to engage their workers in green and innovative practices, as stated by Rahimizhian and Irani (2021).

Notwithstanding, the present research is not free from limitations. Firstly, this is an exploratory study aiming at analyzing the dimensionality of a proposed scale for SOSI built from previously validated subscales and its similarities for two types of tourism companies, that is hotels and travel agencies. Further research should focus on the development and validation of scales based on measurement instruments for SOI, SI and PSS – being considered by Calabrese *et al.* (2018a) as the basis of SOSI, or aligned with the macro and microfactors depicted by Calabrese *et al.* (2018b) for its SOSI tool, and/or to adapt to other subsectors of the tourism industry the SOHSI framework suggested by Ozturkoglu *et al.* (2021) for the food and beverage servicing industry. The scales or indexes should be based on a series of items suggested by a group of researchers and further integrated, skimmed, pre-tested by a judgment sample and integrated following the protocols suggested by Churchill (1979) or Diamantopoulos and Winklhofer (2001), respectively. The items should include additional environmentally-sustainable practices (e.g. use of photovoltaic panels for electricity production, solar energy for warm water, solution for recycling water, desalinization

plant) in further studies in the hotel industry, as well as additional items to measure economic (e.g. making sure that local suppliers profit from the hotel operations, procurement of local products) and social sustainability (e.g. decent wages for employees, absence of gender or racial discrimination towards employees, use of qualified workforce, hiring immigrants) differentiating features in hotels and travel agencies, and the consideration of specific approaches for each subsector.

Furthermore, we have focused on relational innovation to measure non-technological innovation, assuming that it is the most relevant one, given the personal nature, that is the customer involvement in the service delivery provided by tourism companies. However, future studies should also consider other types of non-technological innovation (i.e. marketing and organizational innovation).

Last, the field work has been performed in Spain, which is one of the top tourism destinations in the world and, thus, with a consolidated tourism industry delivering its services mainly to tourists coming from Northern European countries characterized by high levels of familiarity and sensitivity towards innovation and sustainability, respectively. Further research should consider emergent tourist destinations in search of eventual differences.

All in all, this research line opens new avenues around the concept of Sustainability-Oriented Service Innovation –SOSI-, as an emerging field of service innovation, which aims to respond to the current challenge of environmental, social and economic sustainability, as a source of motivation for companies to innovate in their businesses (Calabrese *et al.*, 2018a).

Additionally, future studies may propose and test models analyzing the role of SOSI as an antecedent or a moderating variable of value co-creation and brand equity, cornerstones of consumer experience and behavior, being these more than ever a research priority (Marketing Science Institute, 2022).

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