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BETWEEN FOOTPRINTS: BALANCING ENVIRONMENTAL SUSTAINABILITY AND PRIVACY IN SMART TOURISM DESTINATIONS

ENTRE PEGADAS: EQUILIBRANDO A SUSTENTABILIDADE AMBIENTAL E A PRIVACIDADE NOS DESTINOS TURÍSTICOS INTELIGENTES

ENTRE HUELLAS: EQUILIBRANDO LA SOSTENIBILIDAD MEDIOAMBIENTAL Y LA PRIVACIDAD EN LOS DESTINOS TURÍSTICOS INTELIGENTES

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ABSTRACT
Data lies at the core of all smart tourism activities as tourists engage in different and personalized touristic services whilst the pre/during/post traveling or in holidays. From these interactions, a digital data trail is seamlessly captured in a technology embedded environment, and then mined and harnessed in the context of STD - Smart Tourist Destinations to create enriched, high-value experiences, namely those related to eco-responsibility, as well as granting destinations with competitive advantages. At the same time, these technologies enable tourism destinations for an optimization of the use natural resources and energy, as well as for the preservation of natural spaces, in short, reducing the "ecological footprint" of tourism. However, this comes with a cost, an increased "data footprint". Therefore, the perceived enjoyment of experiences must be considered within the legal framework of Privacy and Data Protection by exposing inherent risks, analysing the available answers given by the GDPR – the General Data Protection Regulation of the European Union. Hence the purpose of this paper is i. to singularize the specificities of Smart Tourism Destinations; ii. to show how the principles of personal data protection, as set forth by the GDPR, are allocated within the STD realm; iii. and, finally, to derive potential legal implications of this ecosystem. Our approach is based on a legal analysis engaged in scholarship research. We have mostly denoted the underestimation of the legal implications of technology-enhanced tourism experiences, and the marginalization of both informed involvement and awareness by the individual in these processes. This study is novel in having undertaken an initial exploration of the legal implications of experiences taking place by STD.

Keywords: Privacy and Data Protection; Smart Tourism Destinations; Sustainability; Personalization.

RESUMO
Os dados estão na base de todas as atividades turísticas inteligentes pois os turistas ficam envolvidos em serviços diferentes e personalizados antes/durante/depois das viagens ou das férias. Para estas interações, um rastro de dados é imperceptivelmente obtido por um meio ambiente embebido em tecnologia, sendo depois minerado e armazenado no

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contexto de Destinos Turísticos Inteligentes para criar experiências valiosas, designadamente relacionadas com a eco-responsabilidade, assim como facultando vantagens competitivas a tais destinos. Ao mesmo tempo, estas tecnologias permitem aos destinos turísticos uma otimização do uso de recursos naturais e da energia, assim como a preservação dos espaços naturais, em síntese, reduzindo a "pegada ecológica" do turismo. Porém, isto ocorre com um custo, o de uma "pegada de dados" acrescida. Consequentemente, a fruição apercebida de experiências tem de ser considerada no contexto normativo da Privacidade e da Proteção de Dados proteção de dados expondo os riscos potencias relacionados que lhe são inerentes, analisando as respostas das pelo RGPD - Regulamento Geral sobre Proteção de Dados da União Europeia. Assim, os objetivos do artigo são os seguintes: i. identificar as especificidades dos Destinos Turísticos Inteligentes; ii. mostrar como os princípios da proteção de dados, tal como constam do RGPD, são relevantes para os DTI; iii, finalmente, avaliar as consequências jurídicas potenciais deste ecossistema. A nossa perspectiva assenta numa análise jurídica de natureza académica. Sobretudo, procuramos mostrar como as implicações jurídicas das experiências turísticas reforçadas pelas tecnologias têm sido subestimadas, tal como o envolvimento informado e consciente das pessoas nestes processos. Este estudo é novo ao ter empreendido uma exploração inicial das implicações jurídicas que resultam das experiências que têm lugar nos DTI.

Palavras-chave: Privacidade e Proteção de Dados; Destinos Turísticos Inteligentes; Sustentabilidade; Personalização

RESUMEN
Los datos están en la base misma de todas las actividades turísticas inteligentes ya que los turistas se quedan inmersos en servicios distintos y personalizados antes/durante/después de los viajes o de las vacaciones. De estas interacciones, un rastro es obtenido de un modo imperceptible a través de un medioambiente embutido en tecnología, el cual es a continuación extraído y almacenado en el contexto de los DTI - Destinos Turísticos Inteligentes para crear experiencias valiosas, señaladamente las relacionadas con la eco-responsabilidad, y bien así proporcionando ventajas competitivas a eses destinos. Asimismo, estas tecnologías permiten a los destinos turísticos una optimización del uso de los recursos naturales y de la energía, además de la preservación de los espacios naturales, en síntesis, reducen la "huella ecológica" del turismo. Sin embargo, esto tiene un coste, el incremento de la "huella de los datos". Por ello, el disfrute apercibido de experiencias tendrá de ser tenido en cuenta en el marco normativo del RGPD – Reglamento General sobre Protección de Datos de la Unión Europea. Por ende, los objetivos de este artículo son los siguientes: i. identificar las especificidades de los Destinos Turísticos Inteligentes; ii. enseñar como los principios de la protección de datos, tal como están en el RGPD, son relevantes para los DTI; iii, en último lugar, evaluar las consecuencias jurídicas potenciales de este ecosistema. Nuestro enfoque se basa en un análisis jurídico de naturaleza académica. En especial, buscamos poner en evidencia como las implicaciones jurídicas de las experiencias turísticas reforzadas por las tecnologías han sido subestimadas, al igual que la participación informada y consciente de las personas en estos procesos. Este estudio es novedoso al haber emprendido una exploración inicial de las implicaciones jurídicas que resultan de experiencias que ocurren en los DTI.

Palabras clave: Privacidad y Protección de Datos; Destinos Turísticos Inteligentes; Sostenibilidad; Personalización.

SUMÁRIO

INTRODUCTION

Smart Tourism Destinations (hereinafter called STD) are an offspring of the technological foundations of *Smart Cities*, themselves benefiting from the interplay with other technological

environments based on the *Internet of Things* (IoT) and the *Cloud*, as enabled by *Big Data Analytics*.

However, while these subjects have been examined extensively within Privacy literature, their specific context and legal consequences on STD is still to be explored. As a matter of fact, this is perceived and pointed out as a missing issue by the Tourism Science literature regarding STD[1].Given the insufficiencies in the literature and these recent claims, this study aims to provide a theoretical review of the technology-enhanced tourism experiences and its legal implications to privacy and data protection.

Theoretically and in practice, STD have been designed to enrich tourism experiences and to enhance the competitiveness of each destination, while preserving the natural environment. As a matter of fact, ICTs embedded within tourism destinations environments allows the collecting and analysis of large amounts of tourism data for the identification of attitude patterns and to predict behaviors of tourists and travelers. This is achieved by addressing their potential needs and desires even at an unconscious level of travelers.

Regarding this connection between Tourism and ICTs, we're facing a specific context, where the relationship between clients and providers, through their apps/services, is generally short-lived, which makes trust-building and costumer's loyalty much harder[2]. Moreover, the need for real-time information *in situ* is so imminent that tourists might be easily persuaded to forego their data, even more when they're focused on eco-responsibility concerns. On another hand, benefits or "*perceived enjoyment*" (evoked by engaging content and interactive system features) are heightened[3], suggesting that personal data and privacy concerns might be temporarily suspended. At the same time, tourism activities take place in locations outside of the usual realm of the traveler and are often facilitated by unknown local service providers, which decrease risk perceptions and therefore personal data and privacy concerns[4], for instance at natural spaces apparently far from urban invasive surveillance. Further, these risks are amplified as the number of connected smart objects grows and are multiplied by the complexities involved in multiple vendors and interoperating systems.

[1]Even being tourism the world's largest industry, with receipts of almost 1,200 USD Billion in 2017, and growth expectations of 4% to 5% for 2018, according to the UNWTO Barometer, notwithstanding internal tourism.
[2] NEUHOFER, Barbara; BUHALIS, Dimitrios. **Smart technologies for personalized experiences:** a case study in the hospitality domain. Electronic Markets, 2015.
[3]Barbara Neuhofer & Dimitrios Buhalis, et al.(2015) op. cit.
[4]GRETZEL, Ulrike; SIGALA, Marianna. Smart tourism: foundations and developments. In: **Electron Markets**, v. 25, n. 3, 2015.

Given the nature of STD and its uses, the application of some of the traditional principles of data processing (*e.g.* the principles of data minimization, purpose limitation, fairness and transparency, and free, specific and informed consent) may be challenging in this technological scenario.

The following illustrative examples provide insight towards the personalized and smart value-added services that STD can offer. Full historic or environmental immersions through smart optics devices or augmented reality for a "*happy guest*" are services already offered. Further, location-based services (LBS) could alert users to the closeness of birds to be watched or to endemic plants. Besides, estimated waiting time for the entrance to Natural Parks and other Protected Sites can be accurately quoted, to the minute, so tourists may reorganize their visiting or trail options or get a drink in a bar while waiting. Besides, aware on customers' special dietary circumstances in regard with their medical condition, as well as religion restrictions, tourism service providers may provide for meals that suits their preferences. As for transport, real-time information about the tourist's destinations, which direction to get on, and the ability to respond (i.e., by suggesting alternatives) to unpredictable events in real-time are envisioned, namely sudden weather changes. RFID tags on their outfit would make it easier to locate travelers in case of being lost or in order to identify those liable for damages inflicted to natural spaces or protected species.

All these enhanced services allow tourists to get much more from their travel and helps them fulfilling the experiential travelling potential of the destination[5].These STD experiences are hence achieved through intensive personalization, context-awareness and real-time monitoring[6]-[7], processes which entail legal risks, demanding a careful analysis within the data protection framework.

As a large spectrum of *tourism data* processed in a smart tourism environment concern personal data and human interaction, there is a direct impact on individuals and their rights with regard to the processing of personal data.

As explicitly mirrored in Article 8 (3) of the Global Code of Ethics for Tourism[8],tourists and visitors should benefit from the same rights as the citizens of the country visited concerning

[5] BUHALIS, Dimitrios; AMARANGGANA, Aditya. Smart Tourism Destinations. In XIANG, Z.; TUSSYADIAH, I. (Eds.). **ICT in Tourism**. Germany: Springer, 553-564, 2014.
[6] Dimitrios Buhalis & Aditya Amaranggana (2014), op. cit.
[7]BUHALIS, Dimitrios; AMARANGGANA, Aditya. STD: Enhancing Tourism Experience Through Personalisation of Services. In TUSSYDIAH, I.; INVERSINI, A., (Eds.). **ICT in Tourism**. Springer, 2015.
[8]http://ethics.unwto.org/en/content/global-code-ethics-tourism-article-8

the confidentiality of the personal data and information concerning them, especially when these are stored electronically. Therefore, it should be underlined that Privacy and Data Protection evaluation is needed in any tourism environment, balancing the tradeoff value and affordances added by STD and its legal protection. This work therefore provides a study of the principles of data protection, as set forth by the GDPR, within the STD context.

The paper[9] is organized as follows. Section 1 refers to the background of STD, describing briefly its origin, constituents, specificities, added-value and objectives. Section 2 provides some of the most important risks that can be appointed to STD regarding privacy and data protection, and its corresponding compliance to the General Data Protection Regulation[10], as the current basis of the Privacy and Data Protection Legal system in the European Union.

1 SPECIFICITIES OF SUSTAINABLE STD

This section describes the constituents of STD, objectives and derived added value.

1.1 Smart Tourism Destinations

In order to characterize more closely the utility functions layered in tourism destinations, it is worthy to point out that successful destinations are composed by five tourism dimensions: transportation, accommodation, gastronomy, attractions and ancillaries services, which can be then structured into six axes or "6As" as the literature[11] describes, namely: i. Attractions, which can be natural, like as mountain or a seaside; artificial, as amusement parks or sports facilities; or cultural such as music festival or a museum; ii. Accessibility refers to the transportation within the given destination; iii. Amenities characterize all services, namely accommodation, gastronomy and leisure activities; iv. Available Packages; v. Activities; and vi. Ancillary Services (e.g. daily use services such as bank, postal service and hospital).

[9] Paper drafted within the framework of the Research Project: "*Big Data*, *Cloud Computing* y otros retos jurídicos planteados por las tecnologías emergentes; en particular, su incidencia en el sector turístico" - DER2015- 63595 (MINECO/FEDER), Coordinated by Professor Apollònia Martínez Nadal at the *Universitat de les Illes Balears*, Spain.
[10]Regulation (EU) 2016/679, of the EP and of the Council of 27/04/2016, on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), applicable from the 25th May of 2018.
[11]AVILA, Antonio L. Smart Destinations: XXI Century Tourism. In: **ENTER2015 Conf. on ICT in Tourism**, Lugano, Switzerland, Feb. 4-6, 2015.

By applying *smartness* into tourism destinations, STD are then additionally defined as *"tourism supported by integrated efforts at a destination, to find innovative ways to collect and aggregate/harness data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into enhanced experiences and business value-propositions with a clear focus on efficiency, sustainability and enriched experiences during the trip"*[12]. This embracing concept comprises three core elements[13]:

i. Reliance on smart technology infrastructures, wireless sensor networks (IoT) and integrated communications systems, e.g. sensor technology, ubiquitous Wi-Fi, near-field communication (NFC), smart mobile connectivity, radio-frequency-identification (RFID), sophisticated data warehouses; data mining algorithms, also considered vital to creating a smart technology infrastructure[14]. IoT provides support in terms of information gathering and analysis as well as regarding automation and control. For instance, chips embedded to entrance ticket, or a smartphone app, allow tourism service providers to track tourists' locations and their consumption behavior, enabling location-based advertising or rescue in case of them getting lost when departing from an usual trail. In addition, cloud computing services may provide access to solid web platforms and data storage through public electronic communications network. It also encourages information sharing, a fundamental feature for STD. For example, a sophisticated tour guide system could serve massive number of tourists without being actually installed on any personal device, even allowing personalizing experiences.

ii. Being a Smart Destinations conceived as "*an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of tourist areas, accessible to everyone, which facilitates the visitor's interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents' quality of life*"[15]; and

iii. Smart business networks, referring to the number of applications at various levels supported by a combination of Cloud Computing and IoT.

[12]Manuel D. Masseno, On the relevance of Big Data for the formation of contracts regarding package tours or linked travel arrangements, according to the New Package Travel Directive, Comparazione e diritto civile, Fasc. 4 (2016).
[13] HÖJER, Mattias; WANGEL, Josefine. Smart Sustainable Cities: Definition and Challenges. In HILTY, L.M.; AEBISCHER, B. (Eds.). **ICT Innovations for Sustainability, Advances in Intelligent Systems and Computing**. NY: Springer. 333-349, 2015.
[14]GRETZEL, Ulrike; REINO, Sofia. Smart Tourism Challenges. In **Journal of Tourism**, v. 16, n. 1, 2015.
[15]Mattias Höjer & Josefine Wangel (2015) op. cit.

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1.2 Techonology-Enhanced experiences

The shared *purpose* of all omni-channel stakeholders of a smart tourism ecosystem is the availability of enhanced/enriched, high-value, meaningful, memorable tourism experiences through smart services and products[16].

Therefore, the implementation of ICT enhances tourism experience through the offer of products/services that are customized, personalized, and mediated through technology (technology-mediated experiences) to meet each of the visitor's unique needs and even implied desires, since understanding the needs, wishes and desires of travelers becomes increasingly critical for the attractiveness of destinations. Personalization is attained by collecting and utilizing personal information about needs/preferences to provide offers and information fitting perfectly clients' needs[17].

These conjugations provide more satisfaction[18] due to access and availability of services and create more meaningful interrelations between the consumer and the experience environment.

The strong impact of technology on experiences is recognized as to label[19] them as "technology-enhanced experiences"[20], and currently as strongly "technology-empowered experiences"[21] in the pre-travel, during travel and post-travel stages. In technology-assisted and technology-enhanced experiences, technology available in the Web 2.0 plays a supporting role to make consumers actively participate and shape the creation of their experiences. Consumers use social media, such as Facebook, Twitter, Flickr or TripAdvisor, to interact with organizations, use review sites, comment and use media to share their experiences[22]. On the other hand,

[16]Antonio L. Avila. (2015) op. cit.
[17]EDWARDS, Lilian. Privacy, security and data protection in smart cities: a critical EU law perspective. In: **European Data Protection Law Review**, v. 2, 2016.
[18]LAW, Rob; LUNG, Rosanna. Information technology applications in hospitality and tourism: a review of publications from 2005 to 2007. In: **Journal of Travel & Tourism Marketing**, v. 26, p. 5-6, 2009.
[19]A common typology of experiences differentiates them in: Conventional experience, Technology-assisted experience, Technology-enhanced experience, Technology-empowered experience, cf. Barbara Neuhofer & Dimitrius Buhalis et al. A Typology of Technology-Enhanced Tourism Experiences, Int. J. Tourism Res., 16 (2014)
[20]NEUHOFER, Barbara; BUHALIS, Dimitrios. Understanding and managing technology enabled enhanced tourist experiences. In: **The 2nd Advances in Hospitality and Tourism Marketing & Management**, Jun., Corfu, 2012.
[21]Barbara Neuhofer & Dimitrius Buhalis et al. (2014) op. cit.
[22]TUSSYADIAH, Lis P.; FESENMAIER, Daniel R. Mediating the tourist experiences access to places via shared videos. In **Annals of Tourism Research**, v. 36, p. 24-40, 2009.

"technology-empowered experiences" emerge from technological developments, such as near field communications, augmented reality and gaming. In this level, technology is pervasive throughout all stages of travel, service encounters and touch points in the physical tourism destination or online space with multiple stakeholders.

Adopted ICT allow tourists to interact, engage and act with the different stakeholders (such as the company, members of staff, other consumers, destination resources or the overall experience space). These new experiences are predicted to be richer, more participatory. In fact, consumers now play an active part in co-creating[23] their own experiences, recognizing these way active consumers co-creating their experiences in a quest for personal growth and value.

It is pertinent to explore what types of ICTs and how these are used by leading companies to enhance experiences in practice. Technologies range from:

i. Interactive websites;
ii. Interactive ordering systems (eTable technology);
iii. Interactive mobile platforms (iPads);
iv. Social media channels (e.g. Facebook, Twitter, TripAdvisor);
v. Mobile applications (Destination Apps).

As an example of i. the interactive online website of PixMeAway[24] is a picture-based search engine that allows consumers to interact with the interface, select appealing travel motifs, photos, the traveler type, and define their travel personality. The website will provide destination suggestions matching their criteria.

As an example of ii., the Inamo Restaurant[25]provides an instance in which the technology empowers the tourism experience. *It introduces a fully digitalized dining experience and interactive ordering system. This system, developed by E-Table, uses a combination of table touchpads and overhead projection to allow customers to see the food and drinks menu projected onto the table surface. The system further allows customers to change table clothes to the current mood and preferences, watch their food being prepared in the kitchen through a webcam in real time, manage the waiter and bills, explore the local neighborhood for activities afterwards or order a cab home. By doing so, the restaurant provides the physical technology (interactive tables) without which the unique dining experience could not occur, rendering the technology the central element of the experience creation.*

[23]PRAHALAD, C. K.; RAMASWAMY, Venkat. Co-creation experiences: the next practice in value creation. In: **Journal of Interactive Marketing**, v. 18, n. 3, 2004.
[24]http://www.pixmeaway.com/
[25]http://www.inamo-restaurant.com/

As an example of iii. the Hotel Lugano Dante[26]provides a case of hotel enhancement context where mobile platforms can come into play to facilitate and enhance the level of interaction between company and guests throughout the entire hotel experience. *Guests provide personal information and preferences, such as room temperature, favorite beverages, and preferred newspapers and so on, whereas members of staff retrieve this specific information. By accessing the platform on a mobile device, the hotel and guests co-create through exchanging information in real time, which are used to facilitate encounters on multiple touch points. This leads to more personalized interactions, more valuable service encounters and on overall enhanced experience for the guest*.

Destination mobile applications (v) characterized by their ubiquity, constant connectivity and access to information anywhere and anytime have led to a behavioral transformation of tourists from *''sit and search'' to ''roam and receive''*[27]

Hence, *Tourism Data* has multiplied, geometrically[28] and its provenance is conveyed through several sources:

> i.online social networks;
> ii. online reviews/ratings;
> iii. intelligent location sensors in interaction with mobile devices;
> iv.transactional communications based on reservations by transportation/hospitality undertaking (airlines, hotel, restaurants and rental car businesses, namely)[29].

Each of these sources provide a massive size of digital traces (data trails or digital footprint), resulting in multidimensional sets of data, known as Big Data[30]. This massification of real-time (tourism) data, from different sources, analyzed by IoT industries, has created big pools of data to mine. Hence, SDT can be considered both as consumers and producers of big data.

Besides, *Tourism Data* reveals specific features, as it holds strategic value, allowing the detection and prediction of future behaviors and trends, allows for the analysis of development and optimization processes of products/services, retention of customers, and ultimately is useful

[26]Barbara Neuhofer & Dimitrios Buhalis et al. (2015) op. cit.
[27]PIHLSTRÖM, Minna. **Perceived Value of Mobile Service Use and its Consequences**. Helsinki: Swedish School of Economics and Business Administration, 2008.
[28]MANYIKA, James; CHUI, Michael. **Big data**: The next frontier for innovation, competition, and productivity. McKinsey Global Institute, 2011.
[29]These activities reveal aspects on destination/origins, way-finding preferences (beach, sports, culture, restaurants, etc.), spending capacities, and on behaviors (family tourism, leisure, night clubs, events, etc.), etc.
[30]HABEGGER, Benjamin; HASAN, Omar. Personalization vs. Privacy in Big Data Analysis. In: **International Journal of Big Data**, Issue 1, 2014.

for future decision-making. This flow of data, inherently cross-border, may consist in personal data, geographical, transactional data (derived from queries/searches, purchases, and other exchanges), feedback data, respectively. These data can reveal commercial preferences of its users, rendering enormous interest for economic operators, and allow cities to better plan for future tourists in terms of mobility, popular attractions, and other potential issues. By managing Big Data, tourism organizations can extract valuable insight from information that could elevate them to a new dimension of customer experience and improve the way they interact with customers, hence gaining competitive advantage[31].

1.3 Environmental sustainability in Smart Tourism Destinations

Sustainable tourism (or eco, green, ethical tourism) has been consensually recognized as a concept, and the three-pillar meaning of sustainable tourism[32] are the economic, socio-cultural and environmental pillars.

The drive towards sustainable tourism has been prompted by concerns about the minimization of environmental damage and impacts of tourism, as mass tourism became environmentally, socially, ethically and politically intolerable[33].

So, the European Charter for Sustainable and Responsible Tourism[34] defines this sustainability-responsibility connection as the awareness, decisions and actions of all those involved in the planning, delivery and consumption of tourism, so that it is sustainable over time. Hence, sustainability is seen as a concept and responsibility as a practice, an appropriate action.

From these conceptual assumptions, the sustainable responsible tourism discourse aims at the implementation and penetration processes of sustainable tourism in a (responsible) destination[35] and in the tourism industry. Such sustainability discussion enticed attention to the need for a balance between economic and environmental interests in tourism, as well as with customer's rights, as citizens.

[31]Dimitrios Buhalis & Aditya Amaranggana (2014) op. cit.
[32]UNEP. **Making Tourism More Sustainable.** Paris: United Nations Environment Programme. World Tourism Organization, Madrid, 2005.
[33]MIHALIC, Tanja. **Tourism and its Environments**: Ecological, Economic and Political Sustainability Issues. Ekonomska fakulteta. Univerza v Ljubljani, Ljubljana, 2006.
[34]TSG, 2012. Charter for Sustainable and Responsible Tourism. European Commission, Brussels.
[35]MIHALIC, Tanja. Sustainable-responsible tourism discourse - Towards 'responsustable'. In: **Tourism, Journal of Cleaner Production**, v. 111, 2016.

Nevertheless, even reflected into good practices, such as energy savings, recycling, a reduction of waste and emissions and attempts to improve the livelihood of the local population, in contrast, the "intellectually appealing" concept and densified practices of sustainable tourism is still elusive, slow and limited in its practical application[36]. Instead, it has turned into a public relations tool (while permitting the same unsustainable behavior as before in tourism industry[37]) for destinations to inaccurately promote themselves as sustainable and attract new tourists.

Conceptually, the coined term *responsustable tourism*[38] is suggested to join two existing terms (sustainability and responsibility) and indicate that the current understanding of responsible tourism behavior is based on the concept of sustainable tourism. However, as the hospitality industry demonstrates, the priority[39] of destinations is their economic results in detriment of environmental performance. Anyway, a destination and its tourism stakeholders might find themselves at any stage on the sustainability-responsibility progression and penetration scale.

2 IMPLICATIONS OF SMART TOURISM DESTINATIONS FOR PRIVACY AND DATA PROTECTION

Big tourism data is an asset being exploited using a multi-modal pipeline of advanced data analysis methods called *big data analytics*[40] comprising: content analytics crawlers (mining unstructured content), machine learning (ML) algorithms, natural language processing tools (NLP) and data mining techniques (DM).

Distinctive aspects of big data analytics are mentioned herewith to foresee its implications on data protection[41]:

[36] CHETTIPARAMB, Angelique; KOKKRANIKAL, Jithendran. Responsible tourism and sustainability: the case of Kumarakom in Kerala, India. In: **J. Policy Res. Tour. Leis. Events**, v. 4, n. 3, 2012.
[37]HIGGINS-DESBIOLLES, Freya. The elusiveness of sustainability in tourism: the culture-ideology o consumerism and its implications. In: **Tour. Hosp. Res.,** v. 10, n. 2, 2010.
[38]Tanja Mihalic (2016) op. cit.
[39] BRAMWELL, Bill; LANE Benard. Research perspectives on responsible tourism. In: **J. Sustain. Tour**., v. 16, n. 3, p. 253-257, 2008.
[40]WATERMAN, K. Krasnow; BRUENING, Paula J. Big Data analytics: risks and responsibilities. In: **International Data Privacy Law**, v. 4, n. 2, 2014.
[41]MANTELERO, Alessandro; VACIAGO, Giuseppe. The 'Dark Side' of Big Data: Private and Public Interaction in Social Surveillance. How data collections by private entities affect governmental social control and how the EU reform on data protection responds in Social Surveillance. In: **Computer Law Review International**, v. 14, 2013.

> i. Big data analytics uses large numbers of ML algorithms against data to find correlations, inferences between data. Once relevant correlations are identified (originally unforeseen), a new machine learning algorithm can be created and deployed to particular cases in the future;
> ii. Tendency to collect and analyze *all* the data that is available;
> iii. Repurposing of data for which it was originally collected, as analytics are able to mine data for new insights and find correlations between apparently disparate datasets;
> *iv*. Use of new types of data automatically generated and coming from the IOT devices, as sensors.

Even though these methods endow stakeholders with a fine-grained data to extract value, trends and patterns, thereby enabling them to customize technology-empowered experiences through smart products and services, they also increase known risks hampering privacy and data protection[42].The following implications, asdescribed in this section, are fueled when information (e.g. mobility data) is conjoined and matched with other publicly available data streams (e.g. Twitter postings, blogs entries, etc.) and analysis identified users' social interactions and activities, as occurred with public bike data[43] or smart tourist travel cards[44]. Access and reuse of information within the framework of a STD collides with legal standards for which the GDPR was designed. We will now bestow attention to the fundamental principles which all organizations must follow whilst processing personal data related to any STD environment, and the implications STD technologies entail to data protection.

a) Identification and re-identification[45] of individuals from allegedly anonymised or pseudonymised data.

Alleged concerns rely on the fact that integrating large collections of data from distinct sources of available tourism datasets, even with apparently innocuous, non-obvious or anonymized resources, may enhance a jigsaw of indirect correlation of identification and re-identification; this scenario could escalate if there is access to rich information resources via the web. Thereby, personal information set through re-identification intrinsically abides to legal requirements, as

[42]COUTURIER, Hervé. **At the Big Data Crossroads**: turning towards a smarter travel experience. Amadeus IT Group, 2013.
[43] SIDDLE, James. **I KnowWhere YouWere Last Summer:** London's Public Bike Data Is Telling Everyone Where You've Been (2014). Disponível em: <http://vartree.blogspot.co.uk/2014/04/i-know-where-youwere-last-summer.htm>. Acesso em: 23 abr. 2018. Also MANTELERO, Alessandro. Personal data for decisional purposes in the Age of Analytics: from an individual to a collective dimension. In: **Computer Law & Security Review**, v. 32, 2016.
[44]ROMANOU, Anna. The necessity of the implementation of Privacy by Design in sectors where data protection concerns arise. In: **Computer Law & Security Review**, v. 34, 2018.
[45]See Art. 29 WP Opinion 6/2003 on the Re-use of public sector information, Opinion 3/2013 on Purpose Limitation, and Opinion 6/2013 on Open Data and Public Sector Information (PSI) reuse.

identification not only means the possibility of retrieving a person's name and/or address, but also includes potential identifiability by singling out, linkability and inference[46]**Erro! Fonte de referência não encontrada.**[47].

Data collected by the ubiquitous computing sensors, are, in principle, personal data[48] or "personally-identifiable information"[49], as the processing of non-sensitive data can lead, through data mining, to data that reveals personal or sensitive information, thus, blurring the conventional categories of data.

In principle, when data is rendered *anonymous* (Recital 26) all identifying elements have been irreversibly eliminated from a set of personal data and cannot leave space to re-identify the person(s) concerned; therefore, it is deemed to be no longer personal data and IoT developers are be able to release, sell or publish the data without data protection requirements. Conversely, de-anonymization strategy in data mining entails that anonymous data is cross-referenced with other sources to re-identify the anonymous data. Thus, the processing of datasets rendered anonymous may never be ensured[50].

When personal information is *pseudonymized*, identifiers are replaced by a pseudonym (through encryption of the identifiers). In turn, pseudonymized data continues to allow an individual data subject to be singled out and linkable across different datasets and therefore stays inside the scope of the legal regime of data protection[51].

b) Lawfulness, Fairness and Transparency

The principle of fairness is preserved in the GDPR in Article 5(1)(a) stating that personal data must be "processed fairly, lawfully and in a transparent manner in relation to the data subject".

At first sight, these principles require that when the data is collected, it must be clear as to why that data is being collected and how the data will be used.

[46]LEONARD, Peter. Doing big data business: evolving business models and privacy regulation. In: **International Data Privacy Law**, n. 1, 2014.
[47]EDPS Opinion 05/2014 on Anonymisation Techniques, p. 10
[48]Art. 29 WP Opinion 4/2007 on the Concept of Personal Data.
[49]ANUAR, Faiz I.; GRETZEL, Ulrike. Privacy Concerns in the Context of Location Based Services for Tourism. In: **ENTER 2011 Conference**, Innsbruck, Austria, Jan., p. 26-28, 2011.
[50]OHM, Paul Ohm. Broken promises of privacy: Responding to the surprising failure of anonymization. In: **UCLA Law Rev.**, v. 57, n. 1701, 2019; and NARAYANAN Arvind; FELTEN, Edward W. **No silver bullet**: De-identification still doesn't work. Freedom to Tinker - Princeton's Center for Information Technology Policy, 2014.
[51]EDPS Opinion 05/2014 on Anonymisation Techniques, p. 10.

Even so, big data algorithms producing results (profiling) are usually invisible and opaque to the user, and its results often impenetrable to laymen; algorithms can learn and change in a semi-autonomous way, making them hard to document, also due to their copyright protecting the software and trade-secret shield[52].

The GDPR prohibits automated individual decision-making that significantly affect individuals (Arts. 22(1) and 4(4)).Yet, from the integration and matching techniques of tourism datasets, knowledge can be produced about users and ease the creation of profiles: consumer, movement, or social profiles. Profiling vests companies, public authorities to determine, analyse or predict people's personality, behaviour, and preferences without their cognition, and make also possible to refer these behaviours and attitudes to perfectly identified individuals. Such processes may and are likely to epitomize privacy invasiveness, waiving the data subjects' control upon their data, and promote direct or indirect discrimination.

However, secret-tracking and decision-making on the basis of profiles are hidden from any individual, which is left without meaningful information about the "algorithmic logic" developing these profiles and has an effect on the data subject[53]. In fact, "(…) *analytics based on information caught in an IoT environment might enable the detection of an individual's even more detailed and complete life and behavior patterns.*"[54]Still, we are attentive to a right to know the "logic of the processing" applied to our data (Recital 63, and Arts. 13(2) (f), and 15(1) (h)), respectively.

Tourism service providers are adapting their serviceable approach to meet the "personalization" expectation[55]. Therefore, user's input and feedback are used to build profiles and recommender systems in the form of trail packages. Such profiling can be considered a risk of "data determinism", in which individuals are not merely profiled and judged based on what they have done, but also a prediction of what they might do in the future[56]. Likewise, in a STD, this can lead to an exclusion/denial of services/goods, e.g. denial of insurances, exclusion from the sale of certain touristic or high-end products, shops or entertainment complexes, even essential utilities for those unwilling to share personal data[57].

[52]SCHWARTZ, Paul M.; SOLOVE, Daniel D. The PII Problem: Privacy and a New Concept of Personally Identifiable Information. In: **NY Univ. Law Review**, v. 86, 2011.
[53]EDPS Opinion 3/2015 on the Europe's big opportunity, EDPS recommendations on the EU's options for data protection reform.
[54]Art. 29 WP Opinion 8/2014 on the on Recent Developments on the Internet of Things.
[55] Lilian Edwards (2016) op. cit.
[56]Benjamin Habegger & Omar Hasan, et al. (2004) op. cit.
[57]Paul M. Schwartz & Daniel D. Solove (2011) op. cit.

Therefore, decisions based on the results provided by Big Data analytics in STD environments should account all the circumstances concerning the data and not be based on merely de-contextualized information or data processing results.

c) Surveillance under the disguise of service provision and desensitizing effect

Data subject's interactions in a smart destination environment will be increasingly mediated by or delegated to (smart) devices and apps. Most of the destinations are using video-surveillance systems as sensors to supply real-time information on public transportation, traffic, in the domains of emergency and personal safety, navigation, and access to tourist information on the go, which all provide value to the user: safety, convenience, and utility in daily lives, as well as in vacation. Such information is transmitted via, for e.g., smart remote controllable digital CCTV cameras that can zoom, move and track individual pedestrians, ANPR (number plate) recognition, GPS, Wi-Fi network tracking reliable facial recognition software, location-based service apps (LBS)[58]. It has been argued that such devices desensitize users about providing location-based information because of the ease with which it happens and the "coolness" factor that comes with it. These developments require devising specially protected digital spaces for children which are particularly vulnerable in the face of data processing practices.

d) Conditions to process personal data: consent, legitimate interests, contract and public sector

In this intelligent environment, it is dubious to give or withhold our prior consent to data collection[59], as it seems to be absent by design. The awareness that the ubiquitous sensors are so embedded in the destination that they literally "disappear" from the users' sight, so that they will not even be conscious of their presence and hence consent to the collection, can be envisaged within STD. We can, at some extent, concede that the obtaining of such consent, in STD contexts, would be defined in a mechanical or perfunctory manner, or as a "routinization".

We note also that as for CCTV, ANPR and MAC whilst tracking and sensing, the notice in the form of information signs in the area being surveilled, or on related websites, does not conform to the consent requirements. The issue of the IoT embedded in STD is that its sensorization devices are explicitly designed to be unobtrusive and seamless, invisible in use and unperceived to

[58]Barbara Neuhofer & Dimitrios Buhalis, et al. (2015) op. cit.
[59]KITCHIN, Rob. **Getting smarter about smart cities**: Improving data privacy and data security. Data Protection Unit, Department of the Taoiseach, Dublin, 2016.

users[60]and thereupon, users do not hold the opportunity give their unambiguous, informed, specific, explicit, and granular consent[61]. Hence, the data controller might have difficulty in demonstrating that the consent was given, and the data subject is not able to withdraw that consent.

Still, consent is not yet part of a function specification of IoT devices, and thus, they do not have means to display "*provide fine-tuned consent in line with the preferences expressed by individuals*," because smart roads, trams, tourist office devices are usually small, screenless and lack an input mechanism (a keyboard or a touch screen)[62].

Regarding the amount and assortment of these interactions, it is just too onerous for each data subject to assess their privacy settings across dozens of entities, if any, in order to ponder about the non-negotiable tradeoffs of agreeing to privacy policies without knowing how the data might be used now and in the future, and to assess the cumulative effects of their data being merged with other datasets[63].

Reverting also to other legal grounds, processing personal data relies on "public interest", which can sidestep the need for consent (health, national governmental agencies gather data for e. g. e-Government systems, e-Health). Nevertheless, this possibility should not conceal any eventual "third-party interest".

Most commercial systems rely on the "legitimate interests" ground, even if they consist in "the vaguest ground for processing"[64], and offers a lot of scope for industry to process data by claiming any deemed necessary "legitimate interest". In fact, the processing must be "necessary" for the legitimate interests and not just *potentially* interesting[65]. It follows that the processing is not necessary if there is any other way of meeting the legitimate interest that interferes less with the people's privacy[66].Implicitly, the task of balancing commercial interests and user fundamental rights[67]is delegated to the controllers themselves[68].

[60]Paul M. Schwartz & Daniel D. Solove (2011), op. cit.
[61] Art.29 WP Opinion 15/2011 on the definition of consent.
[62]Art.29 WP Opinion 8/2014 on the recent developments on the Internet of Things.
[63]Benjamin Habegger & Omar Hasan (2014) op. cit.
[64]EP report on "Big Data and Smart Devices", http://www.europarl.europa.eu/RegData/etudes/STUD/2015/536455/IPOL_STU(2015)536455_EN.pdf.
[65]Big Data, Artificial Intelligence, Machine Learning and Data Protection, UK, ICO, 2017.
[66]Art. 29WP Opinion 06/2014 on the notion of legitimate interests of the data controller.
[67]EDPS Opinion 7/2015 on Meeting the challenges of big data.
[68] Paul M. Schwartz & Daniel D. Solove (2011), op. cit.

As for the contractual condition, it may be difficult to show that big data analytics in STD are strictly necessary for the performance of a contract, since the processing goes beyond what is required to sell a product or deliver a service.

e) Purpose Limitation

This principle utters that the purpose for which the data is collected must be specified and lawful, Art. 5(1) (b). This principle also prevents arbitrary reuse[69], calling for a "compatibility assessment of the new purpose"[70]. As for a repurpose, personal data should not be further processed in a way that the data subject might consider unexpected, inappropriate or otherwise objectionable[71].Exposing data subjects to different/greater risks than those contemplated by the initial purposes could be the considered as a case of further processing of data in an unexpected manner.

In what refers the compatibility assessment, Article 29 WP states that "*By providing that any further processing is authorized as long as it is not incompatible (…), it would appear that the legislators intended to give some flexibility with regard to further use. Such further use may fit closely with the initial purpose or be different. The fact that the further processing is for a different purpose does not necessarily mean that it is automatically incompatible: this needs to be assessed on a case-by-case basis*". This Opinion sets out an approach to assessing whether any further processing is for an incompatible purpose. Moreover, Recital 50 of the GDPR states that in assessing compatibility it is necessary to take account of any link between the original and the new processing, the reasonable expectations of the data subjects, the nature of the data, the consequences of the further processing, and the existence of safeguards.

Yet, automatic capture of tourism data through sensors might be collected for potentially secondary unauthorized purposes that had not been initially scheduled or still to be discovered, or for profiling, for abusive marketing activity, undermining this way the purpose limitation principle.

Anyway, in practical settings, companies "*repackage data by de-identifying them (using pseudonyms or aggregation) or creating derived data, with only the original dataset being subjected to data minimization. The repackaged data can then be sold on and repurposed in a*

[69] Art. 29 WP Opinion 03/2013 on Purpose Limitation, p.21.
[70] Big Data, Artificial Intelligence, Machine Learning and Data Protection, UK, ICO, 2017.
[71]COUNCIL OF EUROPE. **Guidelines on the protection of individuals with regard to the processing of personal data in a world of Big Data,** T-PD (2017). Disponível em: <https://rm.coe.int/16806ebe7a>. Acesso em: 23 abr. 2018.

plethora of ways that have little to do with the original reason for data generation and without the need to give notice or consent to those that the data concerns"[72].

f) Data Minimization: collection and retention

The GDPR says personal data shall be "adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed", Art. 5 (1) (c), and so organizations should minimize the amount of data they collect and process, and the length of time they keep the data.

Yet, in substance, smart technology purports the massive collection, aggregation and algorithmic analysis of all the available for various reasons, such as understanding customer buying behaviors and patterns or remarketing based on intelligent analytics.

Big data analytics may discover unexpected correlations that do not retrospectively justify obtaining the data in the first place, for example, between data about people's lifestyles and their credit worthiness. Therefore, organizations need to be clear about which data is deemed to be *necessary, excessive* and *relevant* for the purposes of the processing.

In addition, personal data shall not be kept longer than necessary for the purpose for which it is being processed, as prescribed by the *storage limitation principle*, Art. 5 (1) (e). This principle is becoming part of the "lifecycle governance strategy" retention policies of companies[73], such IBM, that defensibly dispose irrelevant data instead of keeping data archived forever. Retention schedules allow unnecessary data to be disposed of as it is no longer of business value or needed to meet legal obligations.

g) Accurate and up-to-date processing

Results drawn from data analysis may not be representative or accurate (Art. 5 (1) (d)), if sources aren´t accurate as well (*i*.e. analysis based on social media resources are not necessarily representative of the whole population at stake). Machine learning itself may contain hidden bias which lead to inaccurate predictions and profiles about individuals. Profiling involves creating derived or inferred data, leading to incorrect decisions (discriminatory, erroneous and unjustified, regarding their behavior, health, creditworthiness, recruitment, insurance risk, etc.)[74].

[72] SOLOVE, Daniel D. 'I've Got Nothing to Hide' and Other Misunderstandings of Privacy. In: **San Diego Law Review**, v. 44, 2017.
[73] See http://public.dhe.ibm.com/common/ssi/ecm/wv/en/wvw12356usen/WVW12356USEN.PDF
[74]Big Data, Artificial Intelligence, Machine Learning and Data Protection, UK, ICO, 2017.

Even exercising the "*right to be forgotten*" (Art. 17), where data subjects will have the right for their data to be erased in several situations, for e.g., when the data is no longer necessary for the purpose for which it was collected, or based on inaccurate data, it may be difficult for a business to find and erase someone's data if it is stored across several different systems and jurisdictions[75].

Further, inaccuracy of data endangers the data quality principle and triggers abstract strict liability for damage[76].

h) Accountability

This principle of accountability (Art. 5(2)) requires organizations to demonstrate compliance with all the principles in the regulation, requires maintenance of records of processing activities, and to appoint a data protection officer (DPO). However, an organization's records may change as new correlations in the data are discovered which prompt different uses.

i) Privacy by design

By design solutions consist in an approach in which IT system designers should code preemptive technological measures aimed to address data protection and privacy concerns applied to the very same technology that might create risks (Art. 25)[77].

In an STD scenario, controllers and processors should test the adequacy of the by-design solutions adopted on a limited amount of data by means of simulations, before their use on larger scales, in a learn-from-experience approach. This would make it possible to assess the potential bias of the use of different parameters in analyzing data and provide evidence to minimize the use of information. By-design solutions should be adopted to avoid as much as possible sensitive data to be used to infer sensitive information.

[75]BARTOLINI, Cesare; SIRY, Laurence. The right to be forgotten in the light of the consent of the data subject. In: **Computer Law & Security Review**, v. 32, 2016.
[76]HOEREN, Thomas. Big Data and Data Quality. In: HOEREN, Thomas; KOLANY-RAISER Barbara (Eds.). **Big Data in Context** - Legal, Social and Technological Insights. Springer, 2018.
[77]BORGESIUS, F. J. Zuiderveen. Singling out people without knowing their names – Behavioural targeting, pseudonymous data, and the new Data Protection Regulation. In: **CLSR**, v. 32, n. 2, 2016. Also KING, Nancy J.; FORDER, Jay. Data analytics and consumer profiling: Finding appropriate privacy principles for discovered data. In: **Computer Law & Security Review**, v. 32, 2016.

However, there is a lack of a privacy mindset in IT system designers[78], as reported by ENISA[79] "(…) *privacy and data protection features are, on the whole, ignored by traditional engineering approaches when implementing the desired functionality. This ignorance is caused and supported by limitations of awareness and understanding of developers and data controllers as well as lacking tools to realise privacy by design. While the research community is very active and growing, and constantly improving existing and contributing further building blocks, it is only loosely interlinked with practice.*"

CONCLUSION

This study is novel in having undertaken an initial exploration of the legal implications that technology-enhanced (and empowered) tourism experiences imply to data protection and privacy, even when those creating STD have the best intentions, namely regarding the minimization of its environmental impacts. The preceding analysis brings out that smart tourism is becoming a big contributor and benefactor of ubiquitous, always-on data capture about customers towards empowered tourism experiences, and competitive markets.

Smart technologies used in STD often produce situations of imbalance, where data subjects are not aware of the fundamental elements of data processing and related consequences, being unable to negotiate their information, which leads to a side consequence of enhanced information asymmetry[80], and with new forms of ICTs emerging over the coming years, more types of technology-empowered experiences are expected to flourish further and trigger new challenges to the body of tourism knowledge. The apprehension here is to understand if the affordances of the technology, the personalized services, and enhanced experiences can cope with data protection obligations without a micro-targeting and profiling for unintended uses, safeguarding

[78]For illustration purposes, we quote P. Leonard "*Our findings indicate that software designers frame privacy mainly as a matter of information security (…) secrecy and internal permission systems in the organization; other principles, such as notice, consent, and rectification, were hardly found as part of the designers' perception of privacy. (…) designers perceive privacy as a theoretical-abstract concept, rather than an applicable principle in designing information systems. Moreover, they demonstrate an ambivalent attitude towards the issue whether they are responsible for addressing privacy concerns. (…) The organisational culture of commercial companies (…) ignored or discouraged consideration of PbD*". LEONARD, Peter. Doing big data business: evolving business models and privacy regulation. In: **International Data Privacy Law,** n. 1, 2014.

[79]ENISA 2014 Report on "Privacy and Data Protection by Design – from policy to engineering", p.50.

[80] MASSENO, Manuel D. Personal data circulation from the EU to USA and now what for the American Tourism Industry with business in Europe? In: **23rd International Tourism Safety Conference**, Las Vegas, 2016.

the right to equal treatment, to non-discrimination and the protection of personal autonomy based on a person's right to control his/ her personal data, that may never be the price paid for an enhanced environmental awareness.

Controllers should adopt a precautionary approach[81] in regulating data protection in this field of STD, such as adoption of preventive policies concerning the risks of the use of Big Data analytics in tourism, a risk-assessment of the potential impact of data processing on fundamental rights and freedoms of data subjects and provide appropriate measures, such as "by-design" and "by-default" solutions to mitigate the appointed legal risks and implications.

Smart tourism raises big issues with respect to information governance[82] and about correctly deriving the "added" value from information in an open and ubiquitous info-structure. As for now, the current assumption is that all captured information is extremely valuable and necessary to organizations and will be freely provided by the smart tourists who seek enriched tourism experiences[83].

Moreover, the lack of privacy and data protection mindset of engineers and coders working in IoT/cloud business poses a very large problem for the future[84].

It is suggested that STD are to proceed with test prototyping and research before the implementation of new technologies and services in large-scale real-life environments, such as the Mobile Living Lab[85].

Besides addressing related information security issues according to the NIS Directive[86], future research regarding mobile devices and tracking will be needed, following the adoption of the new *ePrivacy* Regulation[87].Also as future work, we will qualify the figures of data controller and processer in the context of STD. As stated in the tourism literature, tourism, by definition, is a service-intense industry with a "business network", since it relies on a number of stakeholders for its ability to deliver products and services[88]. Hence, the term *business network* refers to "a

[81]Big Data, Artificial Intelligence, Machine Learning and Data Protection, UK, ICO, 2017.
[82] HASSON, Tomer Hasson; HADAR, Irit. **Are Designers Ready for Privacy by Design**? Examining Perceptions of Privacy Among Information Systems Designers? TPRC Conference Paper, 2014.
[83] TALLON, Paul P. Corporate governance of big data: perspectives on value, risk, and cost. In: **Computer**, v. 46, n. 6, 2013.
[84] Paul M. Schwartz & Daniel D. Solove (2011) op. cit.
[85] Lilian Edwards (2016) op. cit.
[86]Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union.
[87]Proposal of a Regulation of the EP and of the Council concerning the respect for private life and the protection of personal data in electronic communications, COM/2017/010 final - 2017/03 (COD).
[88]ROBERTSON, Peter J. An Assessment of Collaborative Governance in a Network for Sustainable Tourism: The Case of Rede Turis. In: **International Journal of Public Administration**, v. 34, n. 5, 2011.

collection of inter firm relationships, including alliances, long-term buyer-supplier relationships, and informal collaborations" where each of the actors involved process personal data and therefore their legal obligations should abide to the GDPR.

In presenting an exploration of the technology-enhanced tourism experiences concept, this work hopes to stimulate further interdisciplinary research in the area.

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