



*Empirical Research Article*

## Factors Influencing the Data Sharing Practices of European Tourism Stakeholders: Considerations for a Sustainable Common European Tourism Data Space

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### Abstract

Recognizing the critical importance of data and its vital role in advancing the tourism industry, the European Union has begun to invest significantly in the creation of a common European Tourism Data Space (ETDS), an infrastructure to facilitate the sharing of data among tourism stakeholder organizations. In order to inform the design and governance strategies of the ETDS, a series of binary logistic regression models are evaluated to understand the key factors that influence tourism stakeholders' decisions to share various categories of tourism ecosystem data (i.e., Human Capital, Natural Capital, Built Capital, Economic/Social Capital, Environmental Impact, Economic Impact, and Social Impact data) with third parties. Results based on online questionnaire data obtained from European tourism organizations (n=209) indicate that organizational resources, typology, motivations, and effort expectancy all play varying roles in tourism stakeholder data sharing practice. Importantly, this research provides preliminary empirical evidence to support the on-going development of the ETDS. Additionally, this investigation provides the opportunity to revisit the formative theories related to organizational data sharing and to re-evaluate them within the context of today's rapidly evolving tourism sector.

### Keywords

data space, data sharing, diffusion of innovations, information economy, smart tourism

### 1. Introduction

There is no question that data should be considered one of the most important resources for any organization within any sector of the economy. The application of data analytics and business intelligence can empower organizations to improve strategic decision making, monitoring and evaluation, the development of innovation, and profitability (Ciampi et al., 2021; Niu et al., 2021). This potential power of data also pertains to organizations operating within the tourism domain, with data (and the information it yields) serving as the foundation for the Smart Tourism concept (Gretzel, Werthner, et al., 2015). Within this framework, access to relevant data has become an increasingly essential precursor for providing richer, more meaningful tourism and hospitality experiences, for improving the competitiveness of both individual firms and destinations, and for fulfilling the obligations of the tourism sector for future generations by working towards the Sustainable Development Goals (SDGs). Within the Smart Destination framework, it is the exchange of data between the heterogeneous stakeholders within the tourism ecosystem that facilitates the creation of value (Gretzel, Sigala, et al., 2015).

Recognizing the necessity of data and its vital role in advancing the tourism industry, the European Union has begun to invest significantly in the creation of an infrastructure (comprised of both

technical and governance systems) by which all tourism stakeholders (including the SMEs which represent over 99% of the tourism sector in Europe) can more easily identify and gain access to external (third-party) data that are relevant to their organizations (Otto et al., 2022). This initiative is referred to as the common European Tourism Data Space (ETDS) (European Commission, 2023), and similar schemes can be found elsewhere around the world, such as the Singapore Tourism Data Initiative (STAN) (Government of Singapore, 2024). Importantly, the ETDS will be based upon tourism organizations voluntarily sharing access to their data with other third parties. This inter-organizational data sharing will not necessarily be done for "free", however, and the ETDS infrastructure currently under development will support monetization and business models for sharing data and providing data services. In fact, the ETDS is part of a larger EU agenda with the vision of creating a single European market for data (European Commission, 2024). Therefore, the ETDS represents a core component of the Smart Tourism Destination model, which leverages technology to foster commerce, innovation, and competitiveness (Gretzel, Sigala, et al., 2015; Koo et al., 2016).

While the new opportunities afforded by improved access to data are promising, the design and implementation of the ETDS must also address the unique needs and challenges that are faced by European tourism stakeholders if it is to achieve industry-wide

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adoption. For example, many tourism organizations have limited technical skills and varying legal concerns regarding data sharing, and it is uncertain what remuneration, if any, tourism organizations would require in exchange for sharing their data. Additionally, based upon the changing needs and priorities of the tourism sector as a result of the paradigm shifts caused by global warming and the Covid-19 pandemic (Ianioglo & Rissanen, 2020), it is unclear which broad categories of data (e.g., economic, ecological, social) are more or less likely to be shared among tourism stakeholders.

If the ETDS is to indeed serve the needs of the tourism sector, then the motivations and barriers for organizations to voluntarily participate in a data sharing scheme must be well understood. A limited number of studies have previously examined inter-organizational data sharing in governmental, academic, and general business contexts (e.g., Ciampi et al., 2021; Klein & Verhulst, 2017; Welch et al., 2016; Zenk-Möltgen et al., 2018; Zygmuntowski et al., 2021), but the specific perspectives and requirements of tourism organizations remains less understood. To this end, the objective of this research is to understand the key factors that influence various types of tourism stakeholders (e.g., private enterprises, governmental authorities, public-private partnerships, research institutes) to share access of their data with third parties. Therefore, this work builds upon well-established frameworks, including Diffusion of Innovations Theory (Rogers, 1962), Institutional Theory (Scott, 2013), Resource-based view (Hooley et al., 1998), Knowledge-based View (Grant, 1996), and Information Economy (Porat, 2009) to address the following specific research questions:

- RQ1: What are the organizational resources (such as human resources, technical skills, and institutional culture) affecting the data sharing practices of tourism stakeholders?
- RQ2: How do organizational characteristics such as typology, operational scope, and size influence the data sharing practices of tourism stakeholders?
- RQ3: What are the key motivations for tourism stakeholders to make their organizational data available to third parties?
- RQ4: How does the expected effort required to share different types of data (e.g., economic, ecological, social) influence the data sharing practices of tourism stakeholders?

Importantly, this research provides preliminary empirical evidence to support key design decisions for the on-going development of the ETDS. Additionally, this investigation provides the opportunity to revisit the theories related to data sharing within an organizational setting and re-evaluate them within the context of today's rapidly evolving tourism sector.

## 2. Literature Review

Previous work (e.g., Welch et al., 2016; Zygmuntowski et al., 2021) has identified that both public and private entities must consider risks and incentives before making the voluntary choice to share data. Risks can be mitigated through data governance mechanisms that are practical, fair, and transparent. However, as will be the case for the ETDS, there are numerous potential governance models to consider, which must simultaneously align with the values of the EU and meet the needs of all relevant tourism stakeholders. Likewise, incentives play a crucial role in motivating data sharing, and it is therefore necessary to explore the feasibility of all credible business models.

### 2.1 Organizational Resources and Data Sharing

The ETDS is a novel infrastructure for obtaining access to tourism-relevant data, and therefore should be considered an innovation at both the sectoral and organization levels of analysis (Lelo De Larrea et al., 2021). As such, the Diffusion of Innovations theory (Rogers, 1962) provides a useful framework for explaining how and why specific innovations become accepted while others may not. Importantly, the innovation's relative advantage, compatibility, complexity, trialability, and observability are key determinants of adoption (Rogers, 1962). Compatibility (i.e., the extent to which an innovation is consistent with the existing values, processes, experiences, and needs of tourism stakeholders) may be especially relevant when considering the potential barriers of adopting new inter-organizational systems such as the ETDS (Chen et al., 2017). Consistent with the Resource-based view (Hooley et al., 1998), this also suggests that organizational resources related to IT infrastructure (e.g., connectivity, data storage, data analysis, etc.) as well as human resources (e.g., expertise in data analytics, legal requirements of data sharing, etc.) may be a determining factor in an organization's pursuit of competitive advantage through data sharing (Lelo De Larrea et al., 2021).

Furthermore, Institutional Theory (Scott, 2013), which suggests that the values and processes of an organization are shaped in part by external pressures, may further explain the growing importance of data and data analytics for achieving a tourism organization's objectives, and therefore its internal investments and prioritization in the time, resources, and skills required to participate in data sharing initiatives (Soares et al., 2021). Conversely, an organization's lack of specific resources and organizational support for data sharing (i.e., incompatibility) would be a significant barrier for data sharing (Belloc, 2012). The above literature strongly supports the expectation that the availability of internal resources could affect the data sharing practice of tourism organizations, such as participation in the ETDS initiative, and that a variety of different internal resources should be considered. Therefore, the following hypotheses are developed:

- H1: Organizational resource availability will positively influence data sharing.
  - H1a: Organizational technical skills will positively influence data sharing
  - H1b: Organizational IT infrastructure will positively influence data sharing
  - H1c: Organizational time availability will positively influence data sharing
  - H1d: Organizational financial resources will positively influence data sharing
  - H1e: Organizational legal expertise will positively influence data sharing

### 2.2 Organizational Typology Influencing Data Sharing

As previously mentioned, Institutional Theory (Scott, 2013) and Diffusion of Innovations Theory (Rogers, 1962) propose that organizational structures, processes, and behaviors are influenced in part by the external environment in which they operate. This phenomenon is particularly relevant within the tourism industry, which is often times described using the "ecosystem" metaphor, suggesting that value is created through a network of interdependence among tourism stakeholders operating within the same destination (Stienmetz & Fesenmaier, 2013). Within a tourism

value creation network, different organizations have different roles, such as the coordination functions provided by DMOs, and the service delivery functions provided by private enterprises. These different stakeholder types, therefore, often represent different “communities of practice” (Wenger, 2008) with disparate ideals and objectives. As such, the internal values and external stakeholder pressures related to data sharing may differ according to the different roles an organization may have within the tourism ecosystem, and therefore, tourism stakeholder typology could be expected to influence data sharing practice (Stoddart et al., 2020). Furthermore, the level of a tourism organization’s activities are also relevant in this regard, with the degree of influence from external forces potentially explained by the scope of a tourism organization’s operations (e.g., local, regional, national, or multinational) (Krutwaysho & Bramwell, 2010). Finally, the size of an organization is another key consideration (Russell et al., 2008), as larger tourism organizations may be under greater expectations (regulatory or otherwise) to conform with desired outcomes (Willman, 2003), such as the adoption of “data-led decision making” and related data sharing practices. On the other hand, larger organizations may have more resources available for which to influence (i.e., lobby) these external forces, and would, therefore, have greater ability to resist such institutional pressures (Russell et al., 2008). Larger organizations would also be expected to have more internal resources available to invest in data sharing (as discussed previously), if such practices were consistent with existing values and processes (Lelo De Larrea et al., 2021). The above literature elucidates that in addition to an organization’s internal resources, its position and prominence within the tourism ecosystem may affect participation in data sharing initiatives. The following hypotheses are proposed.

- H<sub>2</sub>: Organizational typology will positively influence data sharing.
  - H<sub>2a</sub>: Organizational role (e.g., DMO, NGO, research institution, private enterprise) will influence data sharing.
  - H<sub>2b</sub>: Organizational scope (e.g. local, regional, national, multinational) will influence data sharing practice.
  - H<sub>2c</sub>: Organization size will influence data sharing practice

### 2.3 Motivations for Organizational Data Sharing

In addition to the external pressures to conform with sectoral norms (Scott, 2013; Soares et al., 2021), there are numerous other motivating factors which might explain tourism organizations’ decisions to share data with third parties. Building upon the Knowledge-based view (Grant, 1996), data (and the information and subsequent knowledge derived from data) are considered a source of competitive advantage (Ogutu et al., 2023). Indeed, the Knowledge-based view is a principal motivation for the EU efforts to create the ETDS (European Commission, 2023). Likewise, when considering the data sharing motivations of individual stakeholder organizations within the European tourism ecosystem, the value placed on information and knowledge within the organization should be considered a key antecedent (Williams et al., 2020). A positive valuation of data for decision making may have a positive influence on stakeholder’s willingness to obtain third party data, but, conversely, it may also have a negative impact on an organization’s decision to share its data with third-parties, less they risk losing a key source of competitive advantage within the market (Halawi et al., 2005). Indeed, this threat to lose competitive advantage has been previously identified as a barrier to data sharing (Zygmuntowski et al., 2021). Therefore, schemes such as the ETDS must consider by

which governance and business model mechanisms this “cost” of sharing data can be overcome.

An obvious business model is based upon the Information Economy, which views the value of data (and the information it can produce) as a capital good with an economic value (Porat, 2009). Therefore, tourism stakeholders may be motivated to share data through a mechanism of financial compensation based on the market value of their data. Such schemes have been suggested by previous researchers (Bennett & Collins, 2010), and in terms of the ETDS, would be consistent with the EU’s vision of creating a market for tourism-relevant data (European Commission, 2024).

An alternative business model for data sharing is for access to external, third-party data to be exchanged in return for an organization making its data accessible to external, third parties. A prime example of this approach to data sharing is the TourMIS platform (Wöber, 1998), where national and city-level tourism authorities openly share benchmarking data in-kind with other participants. This concept of data sharing is consistent with Social Exchange Theory, which suggests that two or more actors’ willingness to exchange something of value is determined by self-interests as well as the interdependence and trust between actors (Lawler & Thye, 1999) and may provide another explanation for data sharing behaviors. Such an interchange of data access would represent a reciprocal relationship which, in addition to reducing risks/costs associated with data sharing, may foster additional collaborative partnerships (Lambe et al., 2001).

Social exchange theory may also explain that data are exchanged to support the tourism ecosystem, and that by doing so data sharers benefit through the strengthening of the entire tourism ecosystem and value creation network. This cooperative ideal is that “the rising tide raises all boats” and that by strengthening partners, a firm’s own position within the market will indirectly improve as a result (Fyall et al., 2012; Wang & Krakover, 2008). Furthermore, and related to the discussion of organizational role within the tourism ecosystem, many organization types such as universities/research institutions and DMOs are mandated to support local constituents, partnership networks, and the broader community. However, the desire to voluntarily support the industry can vary significantly among individual organizations and such commitments are often based upon an organization’s strategic goals (Chim-Miki & Batista-Canino, 2017; Lähdesmäki & Takala, 2012). Conversely, the laws, regulations, and policies of a jurisdiction where a tourism organization operates may also be significant push-factors that would influence data sharing. This may especially be the case with private enterprises, particularly SMEs, which with limited resources, would otherwise not participate in a data sharing scheme (King & Teo, 1994).

Sharing data within the tourism ecosystem may also enhance the reputation or brand visibility of stakeholders and this may serve as an additional motivation. Providing a valuable resource (such as high-quality data) may increase an organization’s power or prestige within a collaborative network (Beritelli & Laesser, 2011). Recognition as a leader within the tourism ecosystem may also influence partners’ acceptance of the sharer’s desired standards and the strengthening of network externalities for organizational data services provided by third parties (Christopher & Gaudenzi, 2009). Based on this literature, several different potential incentives for data sharing have been identified. The following set of hypotheses are proposed to further explain how organizational motivations affect data sharing practices:

- H<sub>3</sub>: Organizational Motivations will influence data sharing practices
  - H<sub>3a</sub>: Financial compensation for data access will positively influence data sharing.

- H<sub>3b</sub>: Non-monetary data exchange partnerships will positively influence data sharing
- H<sub>3c</sub>: Desire to support the Tourism Industry will positively influence data sharing.
- H<sub>3d</sub>: Legal requirements will positively influence data sharing.
- H<sub>3e</sub>: Increased brand visibility will positively influence data sharing.

2.4 Data Characteristics and Effort Expectancy

Among potential participants of the ETDS, different data types may be shared differently because of their characteristics and perceived value. Data can be categorized in many different ways. One approach to categorization of data within the context of tourism is to consider what aspects of the tourism ecosystem are measured or represented. For instance, data could represent the various dimensions of human, social/economic, natural, and built capital required as inputs for co-creating tourist experiences and value. Likewise, data are also used to represent the various social, environmental, and economic outputs that result from tourism. Other key characteristics of tourism data include source (machine/sensor generated, human-generated, business-generated), structured vs. unstructured, and other features including volume, velocity, variety, and veracity (Kitchin, 2014; Mayer-Schönberger & Cukier, 2013; McNeely & Hahm, 2014). These characteristics may influence the resources, skills, and perceived effort required for data analysis (McNeely & Hahm, 2014). Effort expectancy, in particular, is frequently identified as an antecedent to a behavioral intention, such as an organization’s intention to share data (e.g., Davis, 1989; Venkatesh et al., 2003). Effort expectancy for differing types of tourism data, therefore, may

be a significant barrier for data sharing among tourism stakeholders. This leads to the final hypothesis:

- H<sub>4</sub>: The expected effort of sharing data will negatively influence data sharing practice.

2.5 Research Model

A visual summary of the four main hypotheses is presented as Figure 1 below. Based on a review of the literature, it is expected that several factors may influence a tourism organization’s decision to share (or make accessible) its data with external stakeholders. Based upon the Diffusion of Innovations Theory (Rogers, 1962) and the Resource-based View (Hooley et al., 1998), the first group of factors can be broadly classified as Organizational Resources. The second group of factors, predominantly based upon Institutional Theory (Scott, 2013), can be categorized as Organizational Typology. Third, the Knowledge-based view (Grant, 1996), Social Exchange Theory (Lawler & Thye, 1999), and Information Economy (Porat, 2009) suggest that various Organizational Motivations will also influence data sharing practices of tourism stakeholders. Lastly, Effort Expectancy (Venkatesh et al., 2003) is also conceptualized as a significant influence upon tourism organizations’ data sharing practices. Furthermore, based upon the expected differences among tourism organization resources, typologies, and motivations, this research will also explore how different types of data (i.e., data representing Human Capital, Natural Capital, Built Capital, Economic/Social Capital, Environmental Impact, Economic Impact, and Social Impact) are shared and how the factors influencing organizational data sharing practice (H<sub>1</sub> – H<sub>4</sub>) may vary based upon the type of tourism data to be shared.

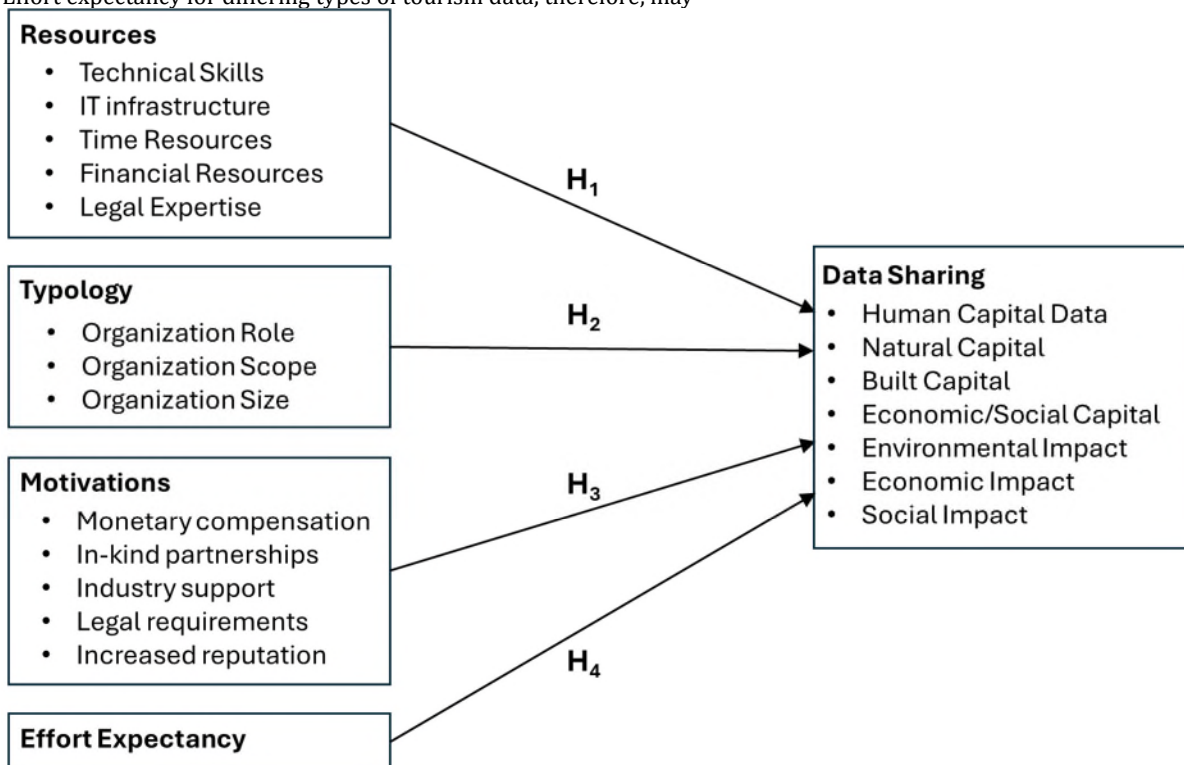


Fig. 1. Research model

### 3. Methodology

This research utilizes secondary data that were originally collected as part of a larger project to develop a blueprint and roadmap for the ETDS. Data were collected via an online questionnaire that included a combination of closed-ended and open-ended questions, as well as definitions for data spaces, and the conceptualization of seven broad categories of tourism data (i.e., Human Capital, Natural Capital, Built Capital, Economic/Social Capital, Environmental Impact, Economic Impact, and Social Impact). Measurement items were evaluated by tourism practitioners for comprehensibility during a pre-test of the survey. Between January 12-31, 2023, the questionnaire was distributed to 246 tourism stakeholder organizations that previously volunteered to participate in the study, of which 192 responded (78% response rate). Questionnaire links were also distributed using the research teams' social media, which yielded an additional 260 responses. All respondents had a managerial or research/data analytics role in their organization, and there was only one respondent per organization. After data cleaning and validation, a total of 209 responses were retained for analysis. Five-point Likert scales and semantic differential scales were used to measure the attitudes, opinions, and behaviors of European tourism

stakeholders' data sharing practices. These scales were recoded with values from -2 to 2, with zero as the mid-point and disagreement/negative sentiment coded as negative integers and agreement/positive sentiment coded as positive integers.

### 4. Findings

#### 4.1 Descriptive Statistics

Table 1 describes the sample of European tourism stakeholders based upon organization type, operational scope, and number of employees. Nearly 85 percent of responding tourism organizations were small or medium-sized enterprises with fewer than 500 employees. The majority of the sample operated at a multinational scope (58.4 percent), followed by national (17.7 percent), local (12.9 percent) and regional (11.0 percent) operations. The types of tourism organizations responding to the survey were varied, with DMOs making up the largest portion of sample (25.8 percent), followed by private enterprises (20.6 percent), and research institutes (17.2 percent).

**Table 1.** Organizational type, scope, and size of sample (n=209)

		Org. Type								Total
		Priv.E.	Priv.A.	DMO	PPP	GOV	RES	NGO		
Org. Scope	Multinational	16.3%	8.1%	14.4%	3.8%	3.8%	9.6%	2.4%	58.4%	
	National	3.8%	1.4%	4.3%	1.4%	1.4%	5.3%	0.0%	17.7%	
	Regional	0.5%	1.0%	2.4%	3.8%	1.4%	1.9%	0.0%	11.0%	
	Local	0.0%	1.4%	4.8%	2.4%	3.3%	0.5%	0.5%	12.9%	
	Total	20.6%	12.0%	25.8%	11.5%	10.0%	17.2%	2.9%	100.0%	
Org. Employees	1	3.8%	1.9%	0.0%	0.0%	0.5%	0.0%	1.4%	7.7%	
	2-9	6.7%	4.3%	3.3%	2.4%	1.0%	1.9%	0.5%	20.1%	
	10-49	3.3%	3.3%	9.1%	3.8%	4.8%	2.4%	0.5%	27.3%	
	50-99	1.0%	0.5%	5.3%	2.9%	0.0%	1.0%	0.0%	10.5%	
	100-499	2.9%	1.0%	4.8%	2.4%	2.4%	2.4%	0.0%	15.8%	
	500+	2.4%	1.0%	1.9%	0.0%	0.0%	9.6%	0.5%	15.3%	
	Total	20.6%	12.0%	25.8%	11.5%	10.0%	17.2%	2.9%	100.0%	

Note: Priv.E.=Private enterprise, Priv.A.= Private association representing tourism stakeholders, DMO= Public administration or governmental body managing tourism, PPP= Public-private partnership organization in tourism, GOV= Local, regional, or national government authority, RES= Research institute/University, NGO=Non-governmental organization

Tables 2 and 3 summarize the current data sharing practices and overall opinions of stakeholders on issues related to data sharing resources, motivations, and priorities. On average, the least available resource and potential organizational barrier to data sharing was financial ( $\bar{x}$ =0.22, SD=1.30), while legal expertise ( $\bar{x}$  =0.86, SD=1.23) was the strongest reported organizational resource with regards to making data available to third parties. The dominant motivation for data sharing stemmed from a desire to support the tourism sector and/or community ( $\bar{x}$ =0.74, SD=0.45) compared to the least common motivation of enhanced brand visibility ( $\bar{x}$ =0.02, SD=0.13). Sharing data freely ( $\bar{x}$ =0.56, SD=0.50) or in exchange for partner data ( $\bar{x}$ =0.37, SD=0.44) were the most preferred data sharing business models, while monetary exchange models were least popular (one-time fee:  $\bar{x}$ =0.26, SD=1.30; per-use fee:  $\bar{x}$ =0.25, SD=0.44; and subscription-based fee:  $\bar{x}$ =0.37, SD=0.48).

As shown in Table 3, the seven broad categories of tourism ecosystem data were not considered equal when it came to both the perceived effort required for sharing and the actual data sharing practice of European tourism organizations. On average, Social Impact data were generally considered the easiest to share ( $\bar{x}$ =0.40, SD=1.40), while in practice Economic Impact data were reported as the most frequently shared by European tourism stakeholders ( $\bar{x}$ =0.66, SD=0.23). Human Capital data were considered the most difficult type of data for tourism organizations to share ( $\bar{x}$ =-0.04, SD=1.27), while both Human Capital data ( $\bar{x}$ =0.23, SD=0.18) and Natural Capital data ( $\bar{x}$ =0.23, SD=0.18) used to describe the tourism ecosystem were reportedly shared the least among tourism organizations.

**Table 2.** Data sharing needs, motivations, and conditions

	Mean	Std. Dev.
In general, my organization has the technical skills necessary for making its data available to third parties <sup>1</sup> (n=169)	0.72	1.20
In general, my organization has the infrastructure, IT systems, and software tools required for making its data available to third parties <sup>1</sup> (n=170)	0.46	1.31
In general, my organization has the time required for making its data available to third parties <sup>1</sup> (n=168)	0.35	1.31
In general, my organization has the financial resources needed for making its data available to third parties <sup>1</sup> (n=166)	0.22	1.30

In general, my organization has the financial resources needed for making its data available to third parties <sup>L</sup> (n=166)	0.22	1.30
In general, my organization understands the legal requirements for making its data available to third parties <sup>L</sup> (n=169)	0.86	1.23
Reasons for Data Sharing - Legal requirement <sup>D</sup> (n=185)	0.28	0.45
Reasons for Data Sharing - Good will/support community and industry <sup>D</sup> (n=185)	0.74	0.45
Reasons for Data Sharing - Revenue source <sup>D</sup> (n=185)	0.23	0.42
Reasons for Data Sharing - Partnership/In-kind exchange for other data <sup>D</sup> (n=185)	0.37	0.48
Reasons for Data Sharing - Brand Visibility <sup>D</sup> (n=185)	0.02	0.13
Conditions for Sharing data with 3rd party - For free <sup>D</sup> (n=185)	0.56	0.50
Conditions for Sharing data with 3rd party - For a one-time fee <sup>D</sup> (n=185)	0.26	0.44
Conditions for Sharing data with 3rd party - For a subscription-based fee <sup>D</sup> (n=185)	0.37	0.48
Conditions for Sharing data with 3rd party - For a per use fee <sup>D</sup> (n=185)	0.25	0.44
Conditions for Sharing data with 3rd party - In-kind exchange/Partnership/Membership <sup>D</sup> (n=185)	0.47	0.50
Conditions for Sharing data with 3rd party - None of the above <sup>D</sup> (n=185)	0.09	0.29

Note: Items marked with L were measured using a 5-point Likert scale, where -2="Strongly Disagree" and 2="Strongly Agree"; Items marked with D were measured using a dichotomous scale, where 0=No and 1=Yes

**Table 3: Tourism ecosystem data shareability and data sharing practice**

	Mean	Std. Dev.
Human Capital Data - Shareability Perception <sup>S</sup> (n=202)	-0.04	1.27
Human Capital Data - Shared in Practice <sup>D</sup> (n=186)	0.23	0.18
Natural Capital Data - Shareability Perception <sup>S</sup> (n=204)	0.35	1.37
Natural Capital Data - Shared in Practice <sup>D</sup> (n=186)	0.23	0.18
Built Capital/Infrastructure Data - Shareability Perception <sup>S</sup> (n=202)	0.22	1.33
Built Capital/Infrastructure Data - Shared in Practice <sup>D</sup> (n=186)	0.32	0.22
Economic/Social Capital Data - Shareability Perception <sup>S</sup> (n=204)	0.03	1.31
Economic/Social Capital Data - Shared in Practice <sup>D</sup> (n=186)	0.39	0.24
Environmental Impact Data - Shareability Perception <sup>S</sup> (n=201)	0.08	1.48
Environmental Impact Data - Shared in Practice <sup>D</sup> (n=186)	0.28	0.20
Economic Impact Data - Shareability Perception <sup>S</sup> (n=201)	0.39	1.43
Economic Impact Data - Shared in Practice <sup>D</sup> (n=186)	0.66	0.23
Social Impact Data - Shareability Perception <sup>S</sup> (n=202)	0.40	1.40
Social Impact Data - Shared in Practice <sup>D</sup> (n=186)	0.45	0.25

Note: Items marked with S were measured using a 5-point semantic differential scale, where -2="Difficult to share externally" and 2="Easy to share externally"; Items marked with D were measured using a dichotomous scale, where 0="No" and 1="Yes"

#### 4.2 Hypothesis Testing

Binary logistic regression was used to model the data sharing practice of EU tourism organizations. Separate models were specified for each of the seven broad categories of tourism ecosystem data and results are reported in Table 4. Based on the Nagelkerke  $R^2$ , the fit of each binary logistic regression model ranged from 0.26 (Human Capital) to 0.45 (Economic Impact). Analysis indicates that overall, relatively few of the hypothesized factors influence an organization's decision to share data, but those factors which are significant differ when it comes to the type of data being shared.

Hypothesis 1 stated that organizational resources would influence data sharing practice. Results indicate that this hypothesis can be accepted for four of the seven data types, with Built Capital data, Economic/Social Capital data, and Social Impact data not having any statistically significant regression coefficients related to organization resources. Interestingly, the specific resource types that have a statistically significant influence on data sharing vary by data type. For Human Capital data, technical skills are positively significant ( $B=0.81, p<.05$ ), while for Natural Capital data, sharing is influenced by both the organization's available time ( $B=0.53, p<.05$ ) and money ( $B=0.49, p<.10$ ). Availability of financial resources is also an antecedent for sharing Environmental Impact data ( $B=0.42, p<.10$ ), whereas legal expertise ( $B=0.46, p<.05$ ) is a statistically significant resource which positively influences the sharing of Economic Impact data.

Hypothesis 2 stated that organizational typology would influence data sharing practice among tourism stakeholders. The results of this study indicate only partial support for this hypothesis, as the sharing of only two of the seven data categories have statistically significant coefficients. It is observed that for Built Capital data, operational scope is an influencing factor as organizations with a national focus ( $B=-1.64, p<.05$ ) have a

statistically significant lower probability of sharing this type of data relative to the reference group of locally focused organizations. It is also noteworthy that the multinational scope ( $B=0.97, p<.10$ ) is observed to have a potential influence on the sharing of Social Impact data. For Economic Impact data, organization type has significant influence, with public-private partnerships ( $B=3.30, p<.05$ ) and DMOs ( $B=2.39, p<.10$ ) having increased probability of data sharing relative to the reference group of NGOs. Interestingly, the size of the organization (operationalized by the number of full-time employees) is not found to have a significant impact on the sharing of any of the seven categories of tourism ecosystem data.

Hypothesis 3 stated that various motivating factors would influence the data sharing practices of tourism organizations. Similar to the previous results, there is limited support for accepting this hypothesis. Statistically significant regression coefficients are observed for five of the seven data categories, with the models for Natural Capital data and Built Capital data being the ones to not have any motivation strongly influencing data sharing. Among the motivating factors, the desire to support the tourism sector and community is positively significant for four of the seven data categories, and is strongest for Social Impact data ( $B=1.27, p<.05$ ), followed by Economic Impact data ( $B=1.15, p<.05$ ), Economic/Social Capital data ( $B=1.15, p<.05$ ), and Environmental Impact data ( $B=0.95, p<.05$ ). This desire to support the tourism sector may also influence the sharing of Built Capital data, though this result is non-significant ( $B=1.05, p<.10$ ). Regarding the sharing of Human Capital data, the only statistically significant motivation is legal requirements ( $B=1.01, p<.05$ ).

Lastly, Hypothesis 4 stated that effort expectancy would influence data sharing practice. Again, there is only limited support for accepting this hypothesis, as the regression coefficient is statistically significant for only two of the seven logistic

regression models. Of the seven data types, easier effort has a positive impact on the sharing of Economic/Social Capital data (B=0.54, p<.05) and Environmental Impact data (B=0.41, p<.05).

**Table 4: Binary Logistic Regression Results, n=153**

		Human Capital Sharing	Natural Capital Sharing	Built Capital Sharing	Econ/Soc. Capital Sharing	Environ. Impact Sharing	Economic Impact Sharing	Social Impact Sharing
		B	B	B	B	B	B	B
Resources	Tech. Skills	0.81**	0.31	0.21	0.17	-0.29	0.50	0.15
	IT Systems	-0.36	-0.46	-0.08	-0.28	-0.01	-0.14	0.10
	Time	-0.10	0.53**	0.08	0.06	0.12	-0.06	0.10
	Money	0.14	0.49*	0.37	0.12	0.42*	0.22	0.26
	Legal Exp.	0.05	0.09	-0.18	0.28	0.35	0.46**	0.22
Org. Type, Ref=NGO	Priv.E.	20.00	-0.09	0.34	-0.88	-0.72	0.73	-1.49
	Priv.A.	20.20	-0.64	1.47	-0.26	-1.60	1.29	-0.75
	DMO	19.25	0.38	1.16	-0.70	-1.56	2.39*	-0.85
	PPP	19.86	1.23	2.13	1.39	-0.74	3.30**	-0.10
	GOV	18.48	0.67	1.56	-0.27	-1.00	1.12	-0.08
Org. Scope, Ref=Local	RES	20.16	-0.29	1.03	-0.02	-0.78	0.91	-0.95
	MULTI	-0.21	-0.74	-0.92	0.80	0.62	-0.59	0.97*
	NAT	-0.83	-1.30	-1.64**	-0.38	-0.80	-1.46	0.64
Org. Size	REG	0.21	-0.59	-0.72	0.32	0.60	-1.79	0.72
		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sharing Motivations	Legal Req.	1.01**	-0.28	0.62	0.84*	0.43	0.59	0.34
	Good will	0.45	0.74	1.05*	1.15**	0.95**	1.15**	1.27**
	Revenue	-0.88	-0.31	0.43	0.71	0.54	0.15	-0.15
	Data Access	0.09	-0.64	-0.04	0.17	0.00	0.64	-0.01
	Visibility	-0.51	-19.54	0.50	-0.30	-20.42	-2.66*	-0.73
Shareability Perception	0.08	0.32	0.25	0.54**	0.41**	-0.20	0.14	
Constant		-21.65	-1.73	-2.27	-2.29*	-1.53	-1.43	-1.52
Model Fit: Nagelkerke R <sup>2</sup>		0.26	0.36	0.27	0.31	0.30	0.45	0.28

Note: \*=*p*-value<.10, \*\*=*p*-value<.05, Priv.E.=Private enterprise, Priv.A.= Private association representing tourism stakeholders, DMO= Public administration or governmental body managing tourism, PPP= Public-private partnership organization in tourism, GOV= Local, regional, or national government authority, RES= Research institute/University, NGO=Non-governmental organization, MULTI=Multinational Scope, NAT=National Scope, REG=Regional Scope

**5. Conclusion**

This research sought to identify the key factors that influence European tourism organizations to share data with external stakeholders. Empirical evidence suggests that an organization’s resources, typology, motivations, and effort expectancy can all play an important role in the decision to participate in a data sharing initiative such as the ETDS. It is crucial to note, however, that the results also suggest that the nuance and characteristics of the data to be shared must also be considered, as the above factors’ influence on data sharing appear to be moderated by the category of data to be shared. A practical implication of this finding is that the success of the ETDS will depend on the effort required to share data using, and that ease of use must be a top design priority for the ETDS infrastructure. Further research is required to understand differences in the effort expected to share different categories of tourism-related data.

Unfortunately, this study has not revealed universal barriers or motivations for data sharing among different tourism stakeholders. This suggests that the final design of the ETDS will need to be flexible and feature a wide range of options related to governance and business models in order to accommodate the heterogenous needs of the European tourism sector. While it is apparent that different tourism organization typologies have differing motivations for data sharing, the results of this study also reveal an established practice of data sharing among most relevant tourism stakeholder types, as evidenced by the principal motivation of sharing in order to support the tourism industry and/or local communities, and the high preference for in-kind data exchange/partnership business models. Therefore, the ETDS should prioritize building upon this collaborative network and supporting options for non-monetary data sharing. Resource issues, such as lack of technical and legal expertise, are relevant for a minority of data categories, but the ETDS

must nonetheless overcome these barriers by ensuring the requisite legal and technical frameworks which reduce uncertainty are embedded within the data space infrastructure. Data sharing could be further stimulated by developing satellite support programs for improving the data-related skills of tourism organizations. Importantly, for the ETDS to be a sustainable system characterized by diverse and active participants, future development should take a bottom-up approach which leverages the apparent “culture of data sharing” among all relevant European tourism organization types.

**6. Theoretical Implications and Future Work**

The results obtained in this study are largely consistent with established theorization. That is to say that the Diffusion of Innovations, Resource-based view, and Institutional Theory are all useful frameworks for which to in part explain the data sharing behaviors of tourism organizations. However, some unexpected findings may also challenge our current understanding. In particular, with the exception of sharing Human Capital data, the IT systems and IT infrastructure of tourism organizations were found to be non-significant resources. This finding seemingly contradicts the important role placed on system compatibility for innovation adoption (Rogers, 1962) and warrants further investigation. One possible explanation of the non-significance of these resource-based factors is that a lack of required resources may not be perceived as a barrier for data sharing if those missing resources are considered to be easily obtainable by the organization. Additionally, it is noteworthy that European tourism stakeholders have a strong preference for the in-kind sharing of data, and that industry support rather than revenue generation are a key motivation for data sharing. Within the framework of Information Economics and the Knowledge-based view, the de-emphasis of data monetization is



unexpected. A potential explanation to be further explored would be a possible perceived lack of demand or value for tourism organization data and the shift towards all actors within the tourism ecosystem having the simultaneous roles of data consumer and data producer. Therefore, additional research should be pursued to better understand the dynamics of stakeholder inter-dependence, cooperation/competition, altruism, and data sharing within the context of tourism ecosystems.

## 7. Limitations

Like all studies, this research is not without limitations. As analysis was based upon secondary data, compromises regarding the operationalization and availability of research model constructs were required. Furthermore, the data were obtained from a sample of European tourism stakeholders and the generalization of the results to contexts outside of Europe may not be appropriate. Finally, this study did not investigate why different tourism ecosystem data types are shared differently, it only explored if differences in sharing practice exist. Future research should further explore the features which make some categories of tourism data more or less sharable (e.g., privacy regulation, complexity, organizational value, etc.).


## Declaration of competing interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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